The background of the slide is a blue-tinted photograph of a large, modern building with a complex, angular roofline, likely a part of the University of Waterloo campus. The building is partially obscured by a semi-transparent dark blue horizontal band that serves as a backdrop for the text.

University of Waterloo

Chemical Engineering

Class of 2020, Profile

Ola Elkhatib

Stream 4, Chemical Engineering Class of 2020

oeikhati@uwaterloo.ca



The Department of Chemical Engineering at the University of Waterloo houses over 1200 students, faculty and staff.

After noticing multiple engineering cohorts (SYDE, Software, etc.) complete a class profile, it seemed like a great idea to complete a similar profile for the Chemical Engineering class of 2020.

This class profile was compiled using **48** responses from the chemical engineering class of 2020 - **57%** of the total graduating class. The data collected and presented herein will be a great resource for future students and those interested in learning more about life as a UWaterloo engineering student.

More importantly, this time capsule will be something the Chemical Engineering Class of 2020 can look back on, recalling a defining 5 years of their life.

Table of Contents/Quick Shortcuts

General Demographics

General (Gender, Ethnicity, etc.)
Places of Birth and Residence
Religion & Politics
Family, Background
Why Chemical Engineering?

Co-op

Companies
Titles & Salaries
Rankings
CECA

Post-Grad

Plans
Salaries, Locations
Titles
Loans, COVID & Future

Academics, School Life

Streams, Averages
Professors
Core Courses, TEs, and CSEs
Specializations, Exchange
Attendance, All-nighters, etc.
Program Satisfaction

Leisure

Extracurriculars
Leisure Activities
Fitness & Exercise
Cooking and Restaurants

Miscellaneous

Mental Health
MBTI, Zodiacs
Reading
Favorites
Pet Peeves
Closing

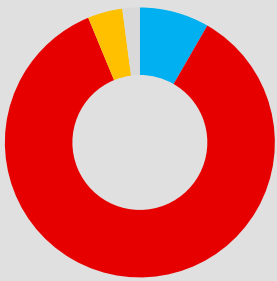
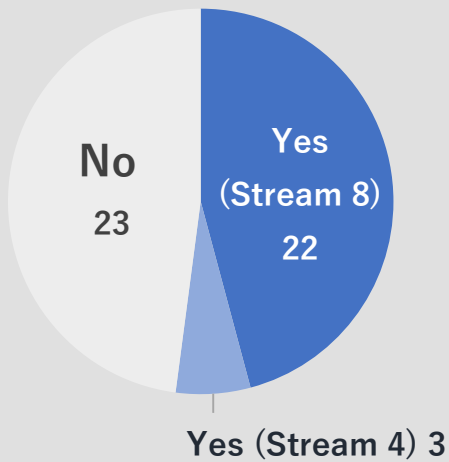
Of the 48 respondents:

24 identified as male,
24 identified as female.*



28 were in stream 4 (55%),
20 were in stream 8 (45%).

25 students specifically applied
to be in a particular stream.



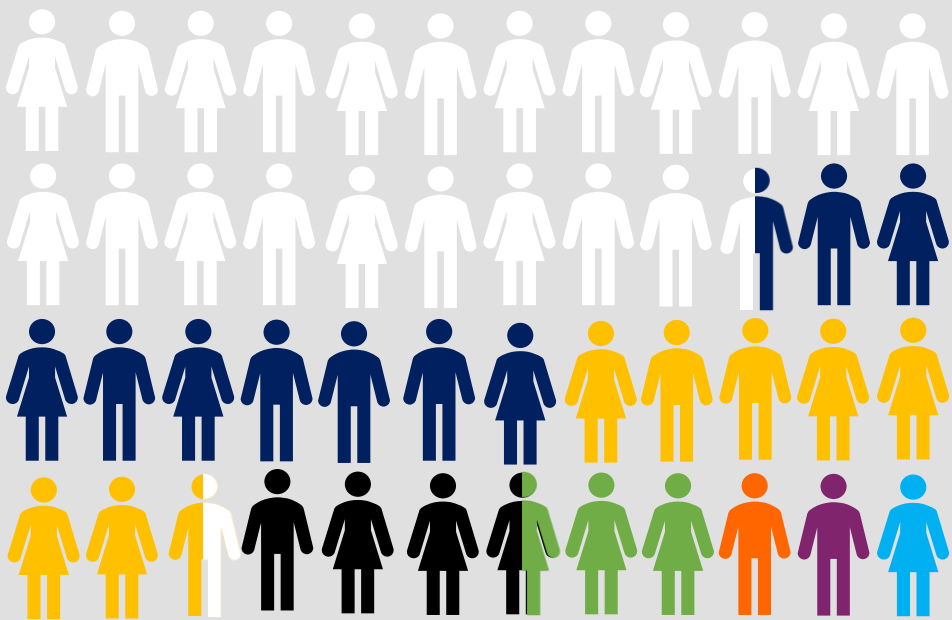
41 identified as **heterosexual**,
4 identified as **bisexual**, and
2 identified as **homosexual**.



1 student
transferred into
ChE from another
program.

The most common ethnic groups were
Caucasian/European and East Asian.

Caucasian/European
East Asian
South Asian
Middle Eastern
African
Afro-Caribbean
South East Asian
Hispanic

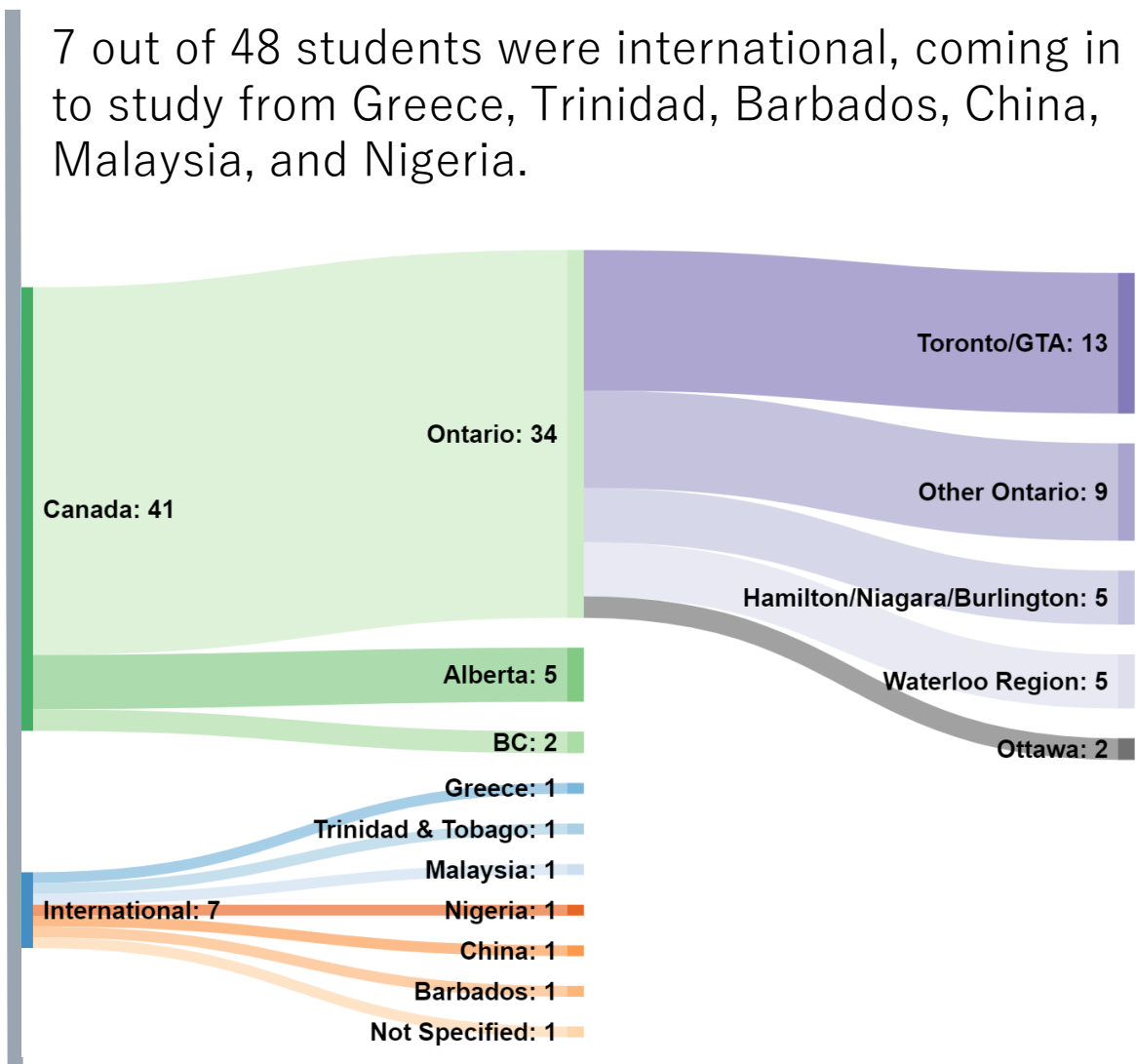


Where do the students come from?

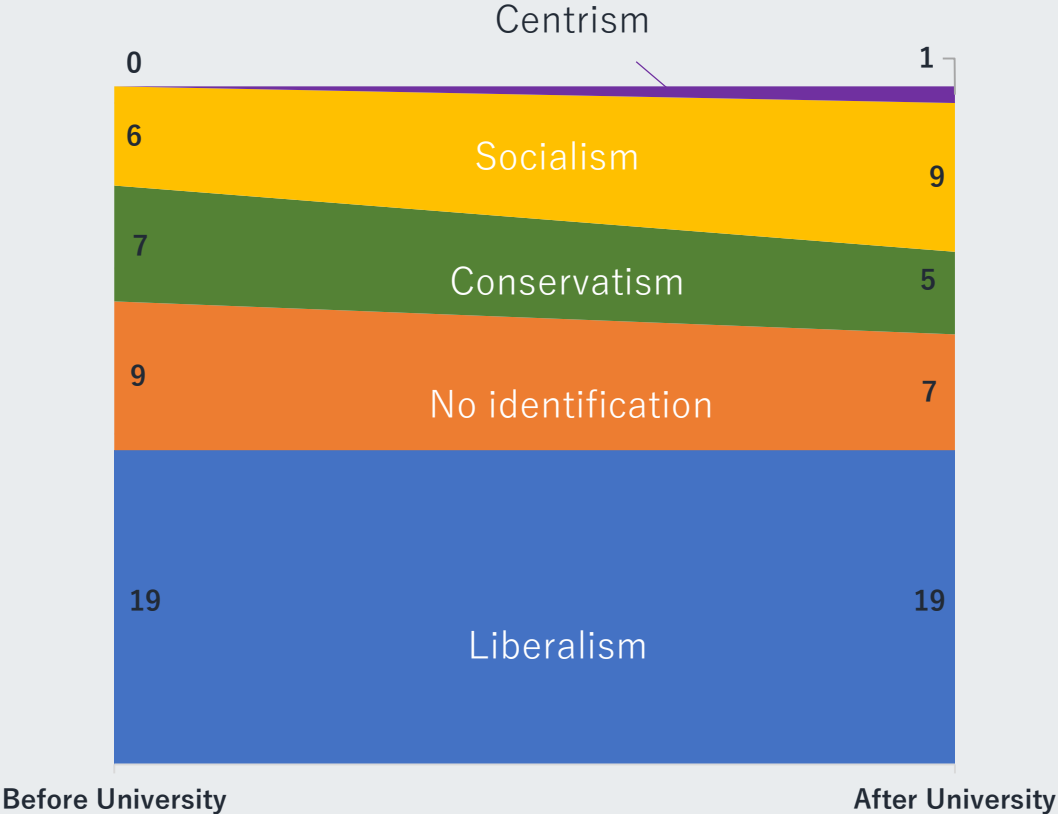
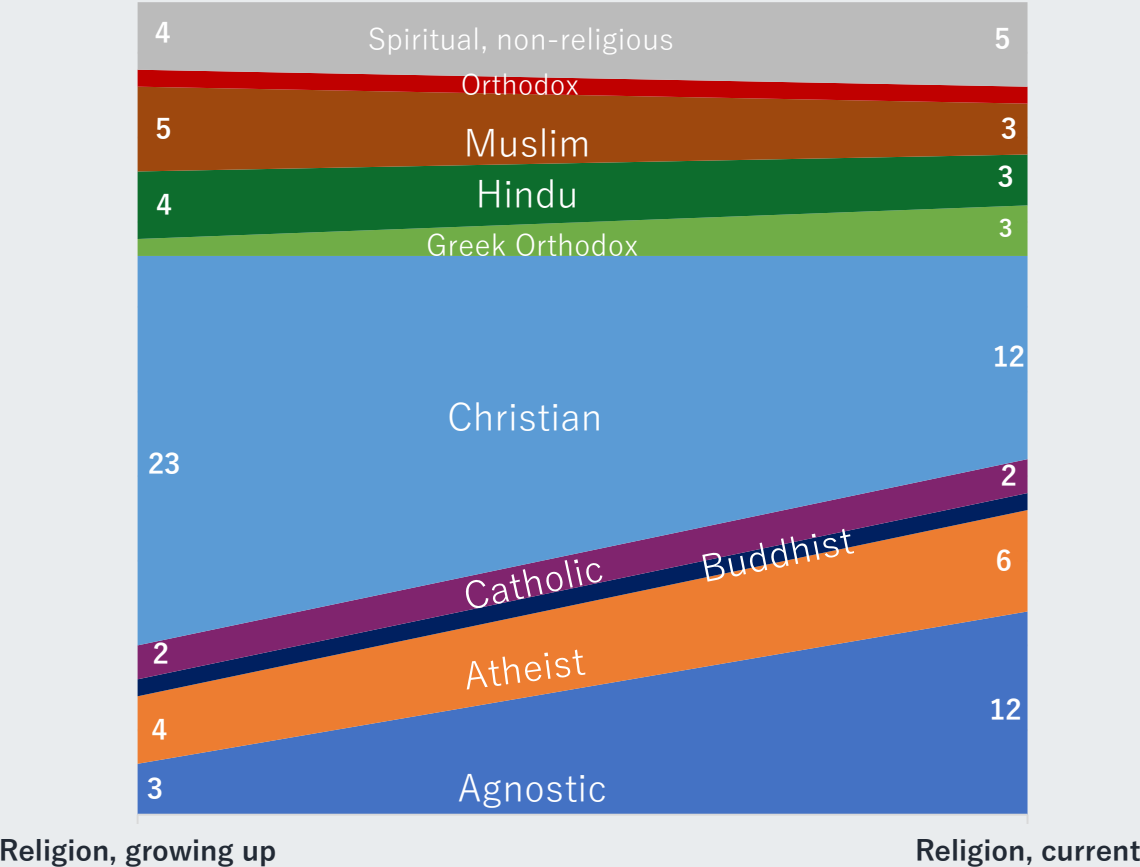


48% of respondents were born in Ontario. Other places of birth include the United Arab Emirates, the Philippines, Serbia, Barbados, Malaysia, Nigeria, China, and more.

7 out of 48 students were international, coming in to study from Greece, Trinidad, Barbados, China, Malaysia, and Nigeria.



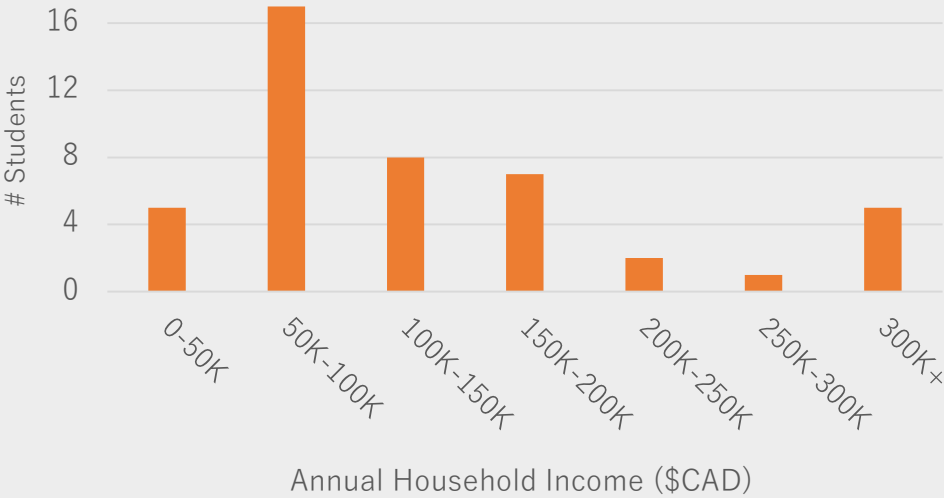
Religion: Despite a majority of the students growing up Christian, there was an even split between the number of Christians and Agnostics in the group*. (n=47)



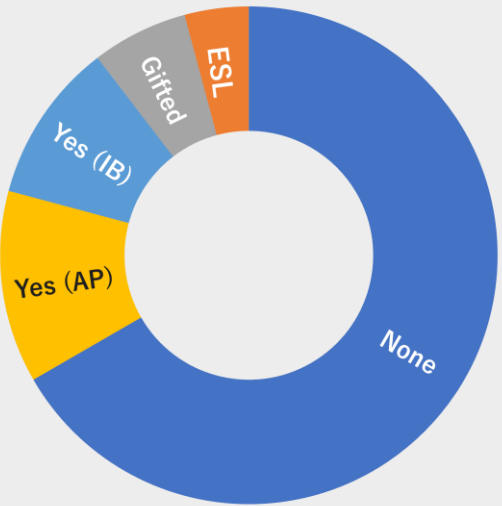
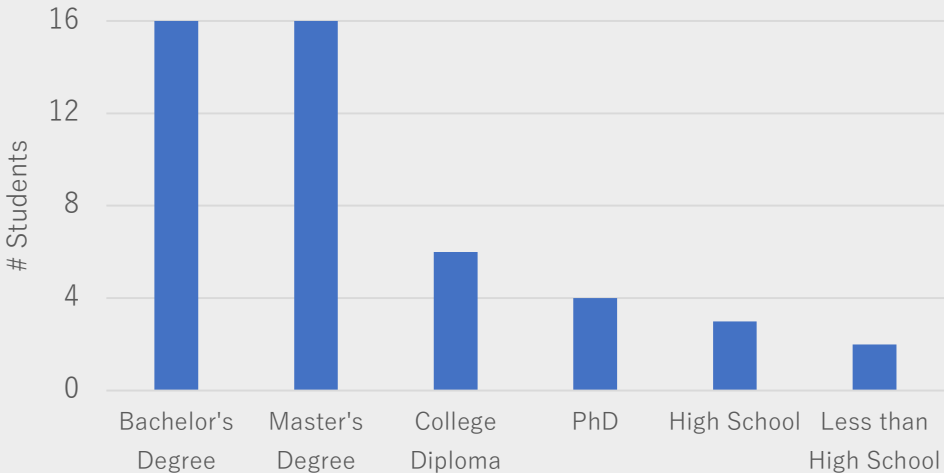
Politics: Most students (both before and after university) claimed liberal political views. A few steered towards socialism by the end of university, and one person claimed somewhere between conservatism and liberalism (centrism)*. (n=41)

*Where numbers are not indicated on the graphs, the value is 1.

Income: Most students came from a household where the income was between \$50,000 and \$100,000. (n=45)

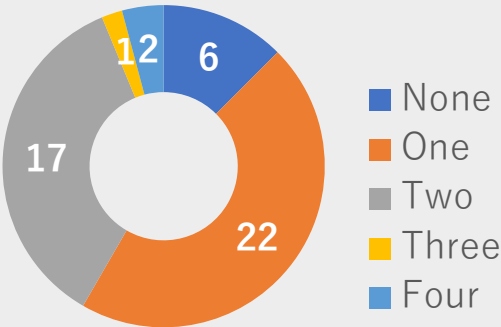


Education: The most common levels of education were a Bachelor's and Master's degree. (n=47)



33% of students were in a modified program in high school.

And as for # of siblings,



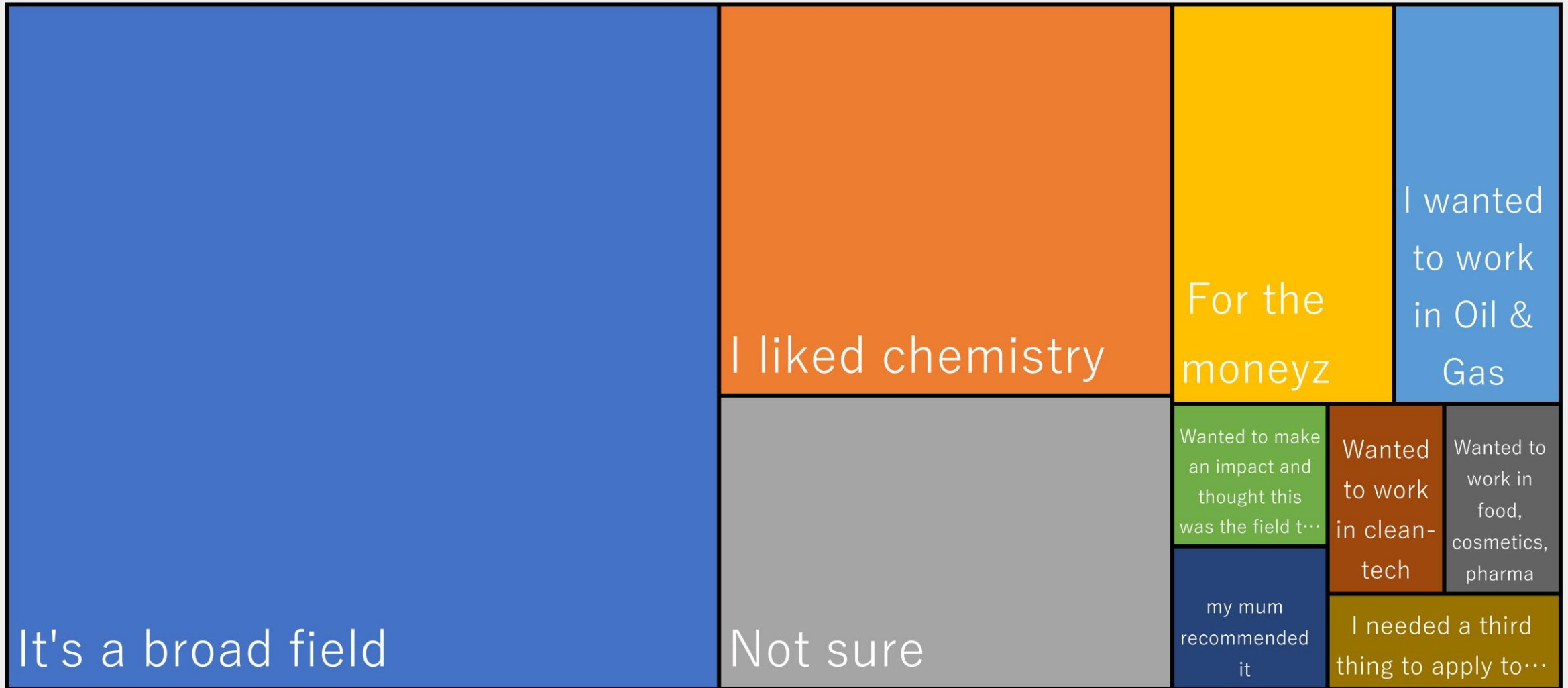
81% of the students had either 1 or 2.

56% of respondents said at least one of their parents pursued a career in STEM.


A possible influence on the student's desire to study ChE?


So, why chemical engineering anyway?

Most people said they applied to chemical engineering because it's quite a broad field.

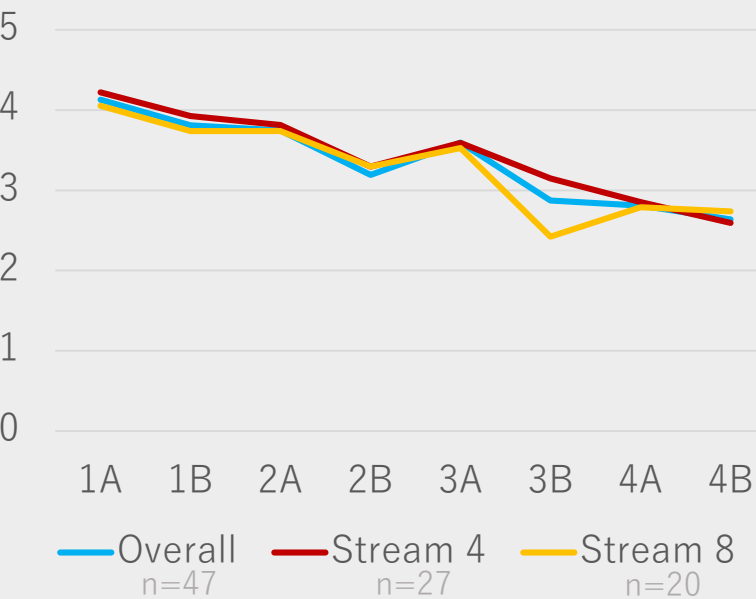


Streams: 7 students switched streams throughout their degree. 5 students switched 1x, 1 student switched 2x, and 1 student switched 3x. Ultimately, most students happened to be happy with their decision⁽ⁿ⁼⁴⁸⁾:

 **82%** of stream 4s were happy with their stream,

 **100%** of stream 8s were happy with their stream.

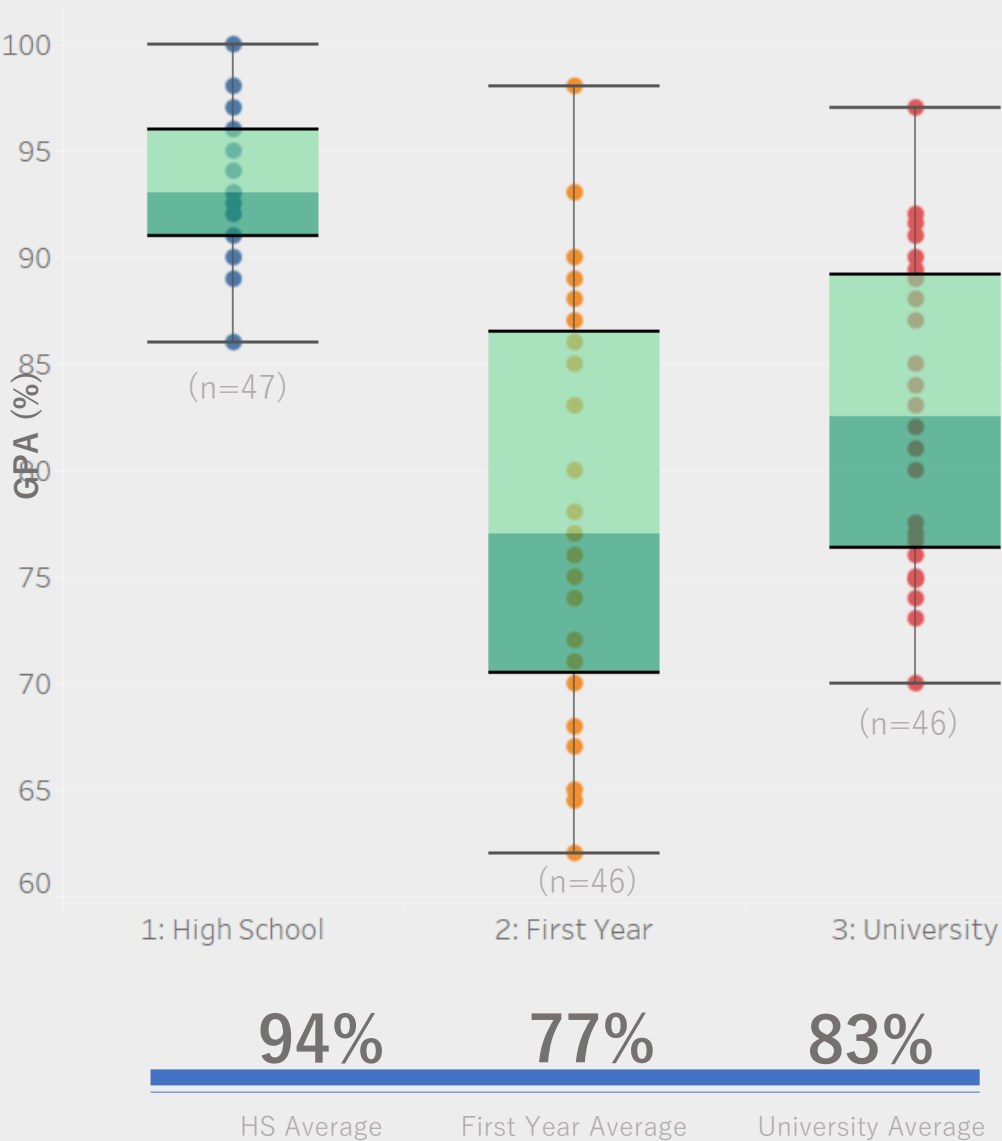
In terms of **stress**,



It went down as terms passed. The streams were mostly aligned on which terms were stressful and which ones weren't.

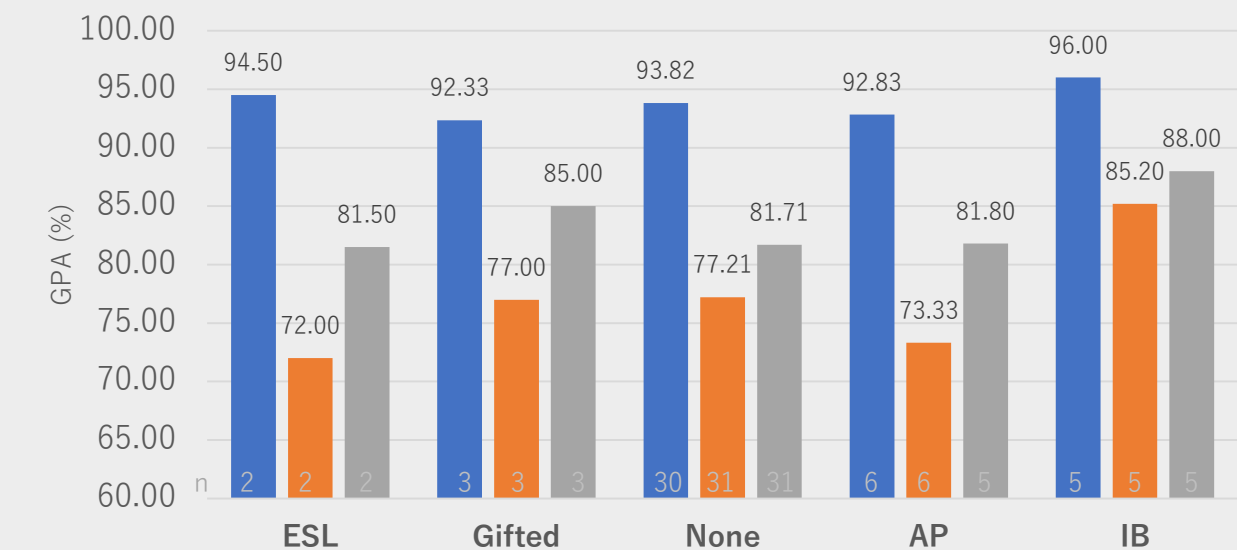
Except for 3B. (which seems to be the least stressful term for Stream 8s?)

Overall 1A was rated hardest, and 4B, easiest.



Student's high school averages dropped by **16%** in their first year of university.

Correlations: Were grades impacted by any factors?

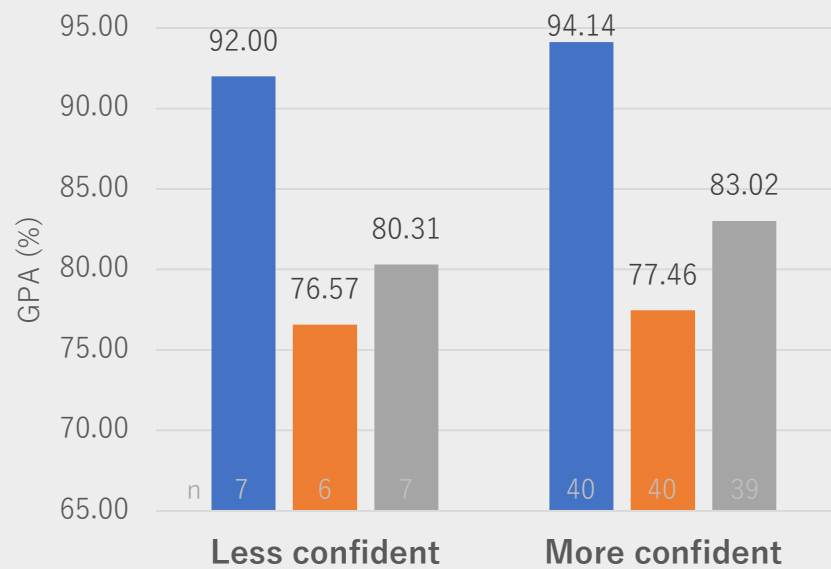
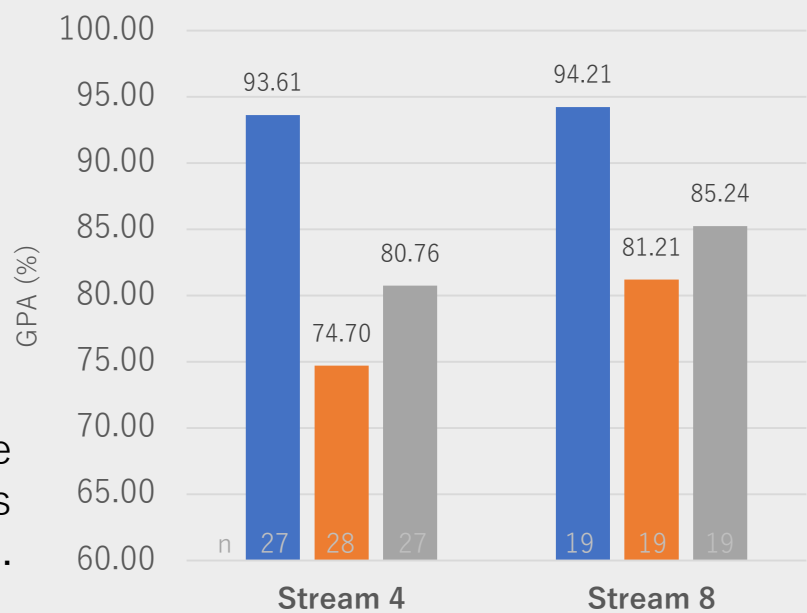


Students coming from IB programs on average had higher grades in university. These students also had the highest average GPA in high school, so that's another thing to consider.

Somehow, AP students had a lower average than non-AP students in first year, but their cumulative GPAs were pretty similar by the end of university.

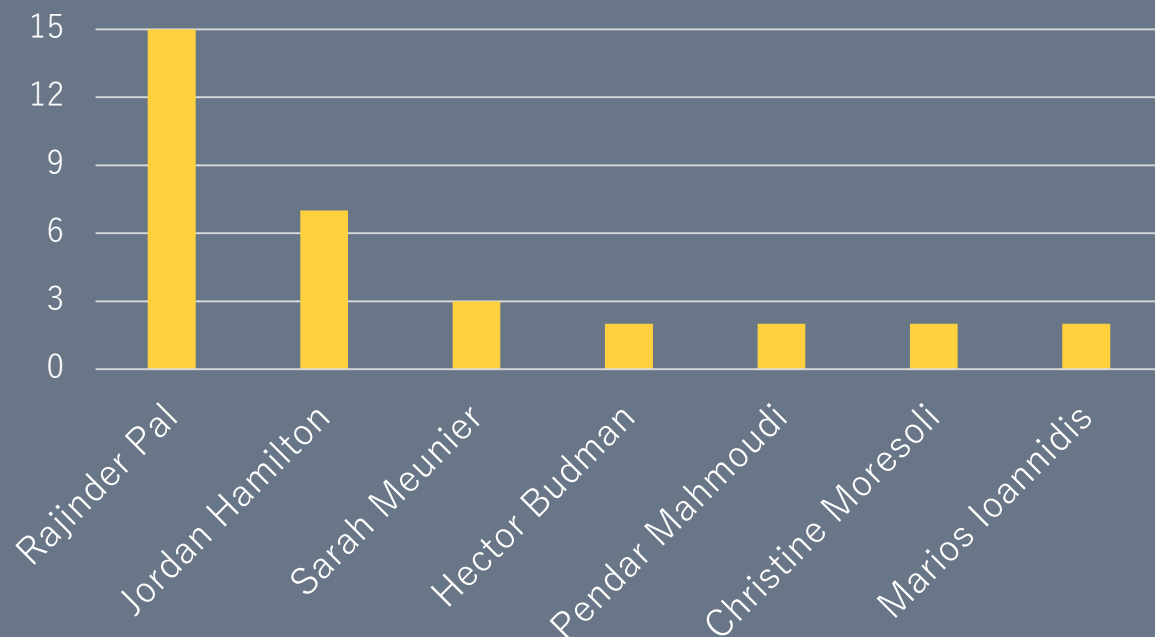
■ High School Average
■ First Year Average
■ University Average

...I think everyone predicted this outcome.



In terms of confidence, students who were more confident had a GPA only 3% higher than those feeling less confident after university.

Favorite Professors

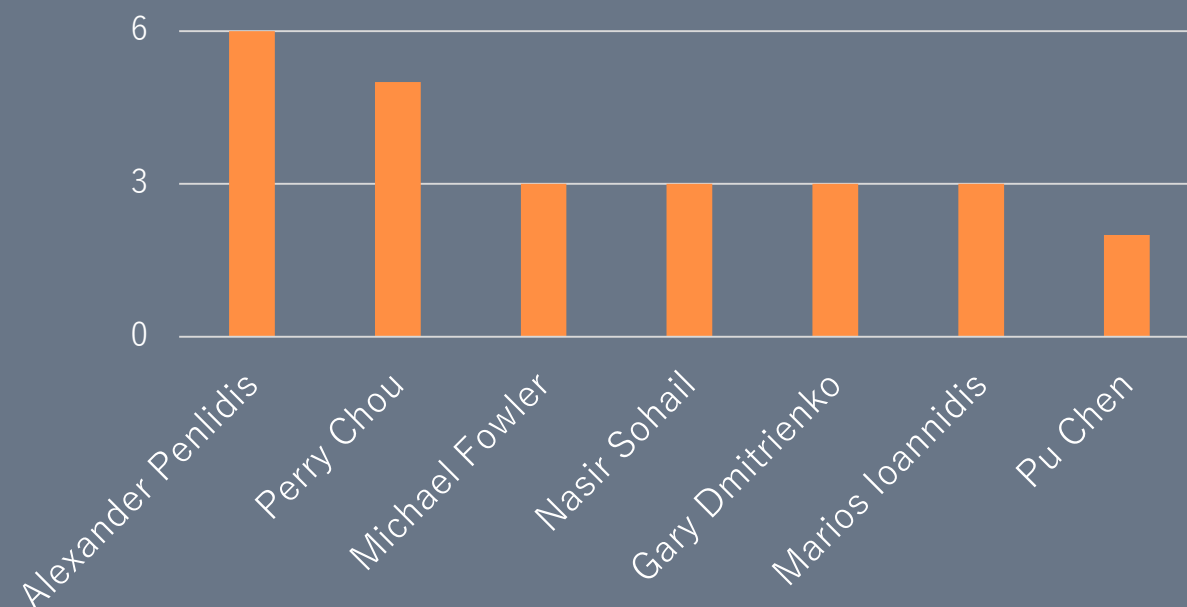


Favorites⁽ⁿ⁼⁴⁵⁾: The most favored professors were Rajinder Pal (CHE 200/330/313) and Jordan Hamilton (MATH 116/118), having both received teaching excellence awards.

Least favorites⁽ⁿ⁼³⁹⁾: The most disliked professors were Alexander Penlidis (CHE 425) and Perry Chou (CHE 161).

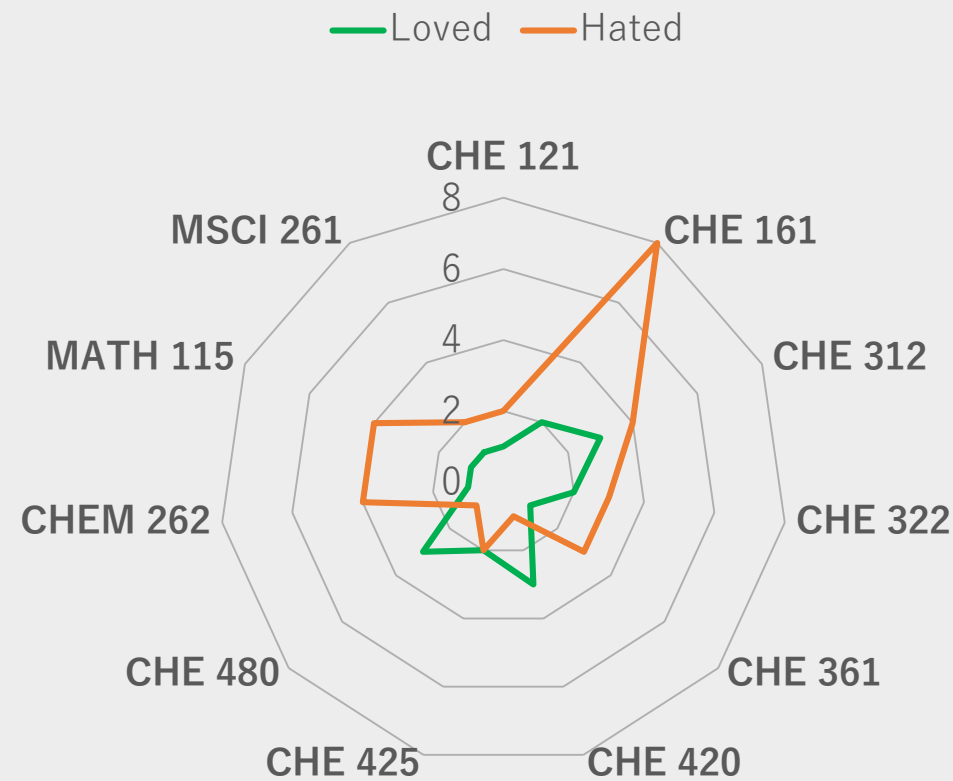
Marios seemed to make the cut for both lists...

Not-so-favorite Professors



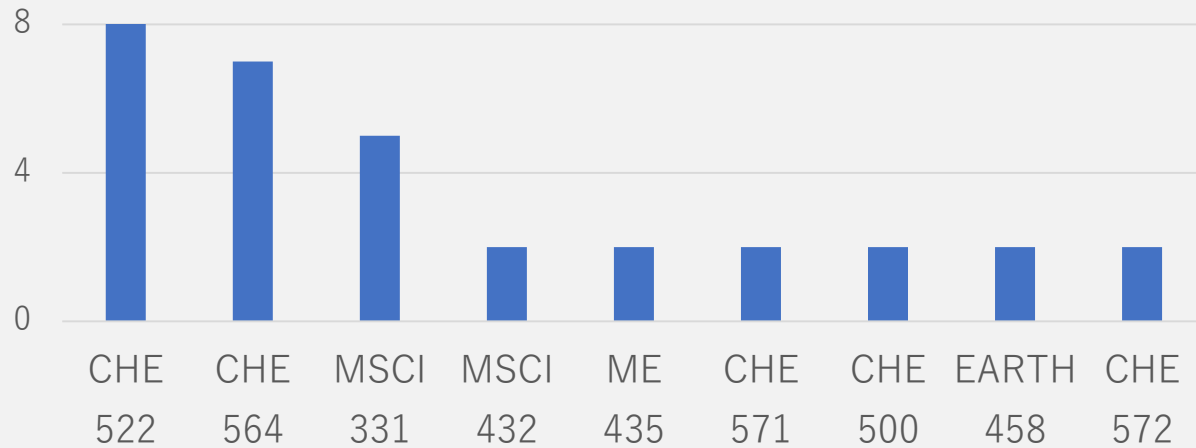
Mandatory Courses: The core course most favored by students was fluid dynamics (CHE 211) and the least favored was Engineering Biology (CHE 161).

Some courses were both loved and hated... like heat and mass I.



n = 45	n = 45
MATH 118	MSCI 261
MATH 116	CHE 425
CHE 425	CHE 121
CHE 322	CHE 361
CHE 314	CHE 322
CHE 313	CHE 102
CHE 262	CHE 102
CHE 241	MATH 115
CHE 161	CHEM 262
CHE 480	CHE 312
CHE 420	CHE 161
CHE 312	
CHE 211	
Favorite	Least Favorite

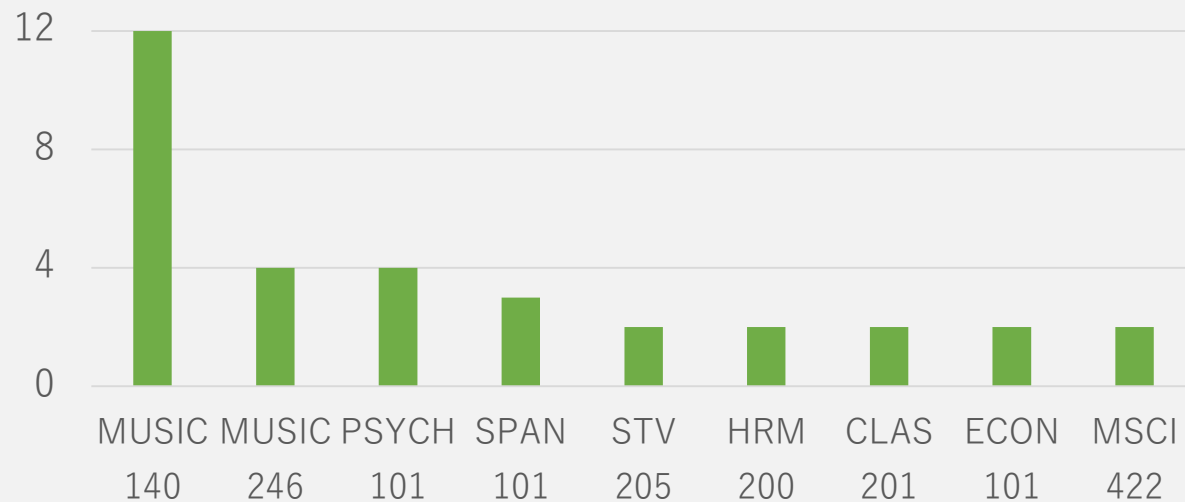
Favorite Technical Elective⁽ⁿ⁼⁴⁰⁾



Electives: The most commonly favoured technical elective was Advanced Process Controls, taught by Hector Budman. The second most favoured course was Food Process Engineering, taught by Tizazu Mekonnen.



Favorite Complimentary Studies Elective⁽ⁿ⁼⁴⁰⁾



As for complimentary studies, The top two electives were music courses taught by Simon Wood. 14 students took MUSIC 140, and 86% of them said it was their favorite CSE (even given the 3-hour weekly lectures).

EPFL



Studying Abroad: Out of all the respondents, 4 students studied abroad. Two students studied at EPFL, Switzerland.

Did anyone pursue **options** or **minors**?



21% of students pursued the **Management Sciences** option.

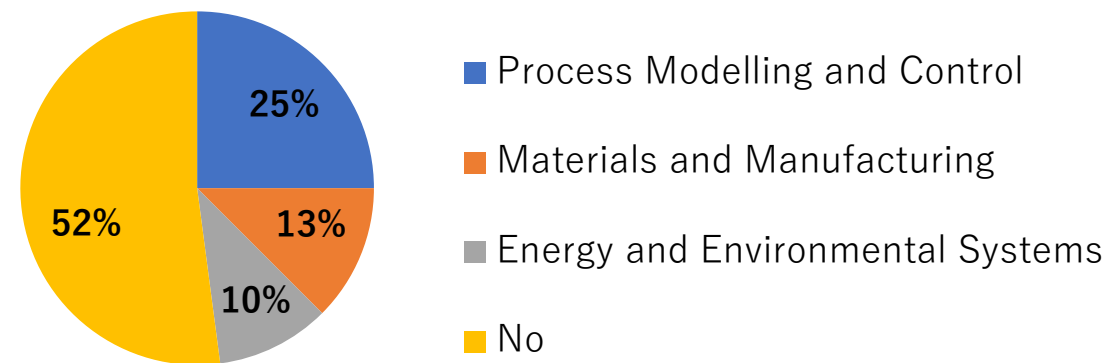


3% (1 student) pursued the **Biomechanics** option.

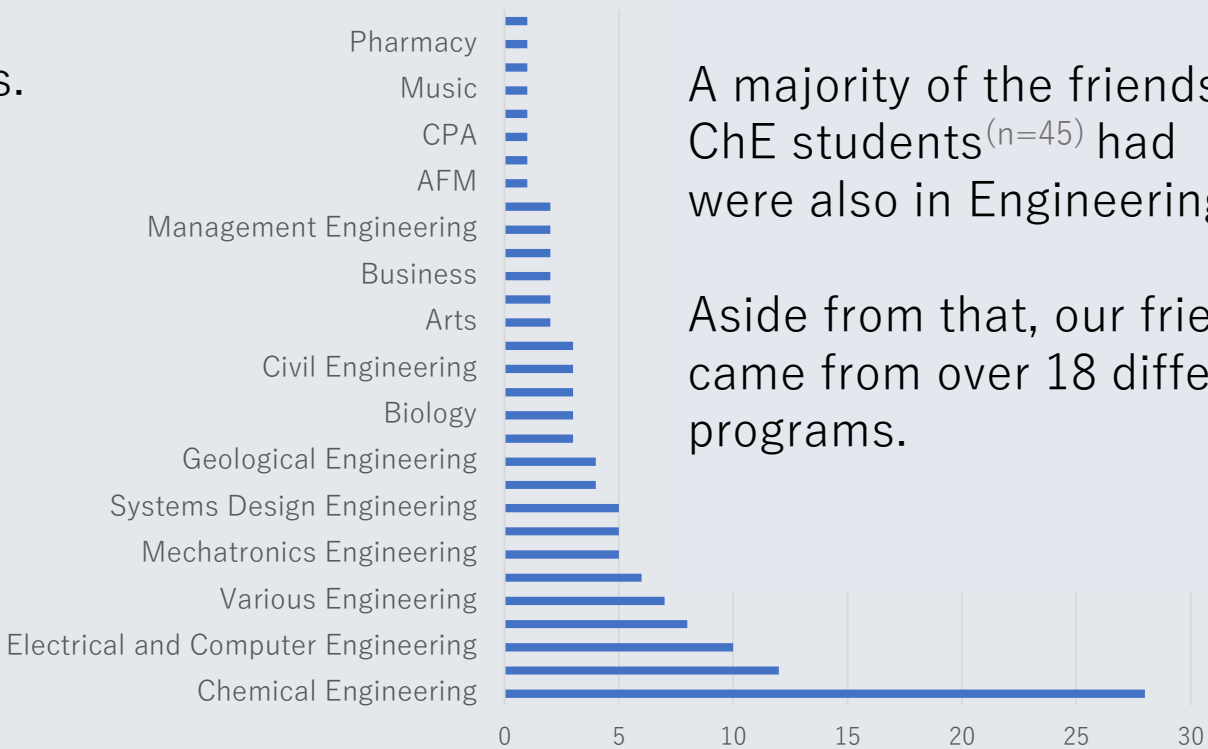
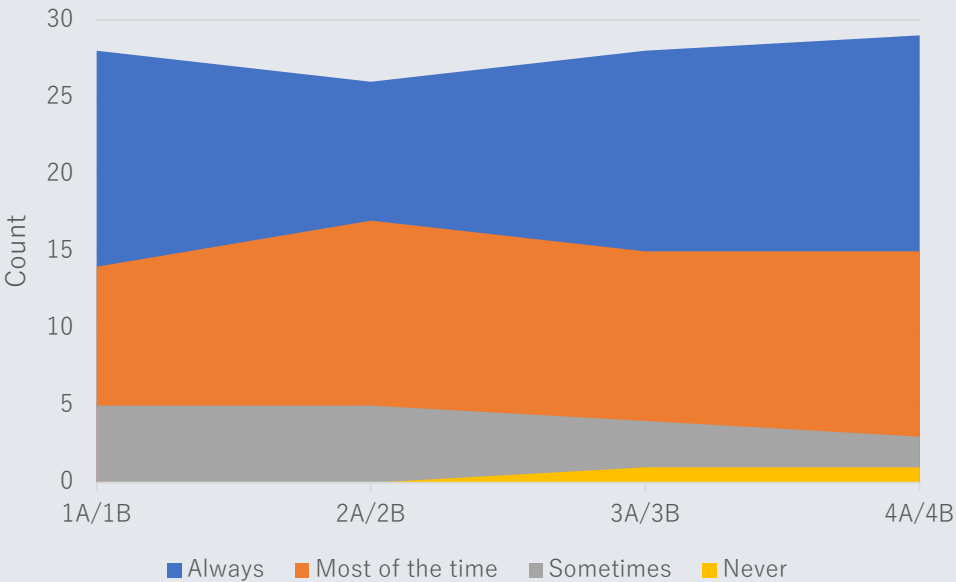
None of the respondents pursued a minor.

As for specializations...

48% of the students completed a specialization. The most popular one was Process Modelling and Control.



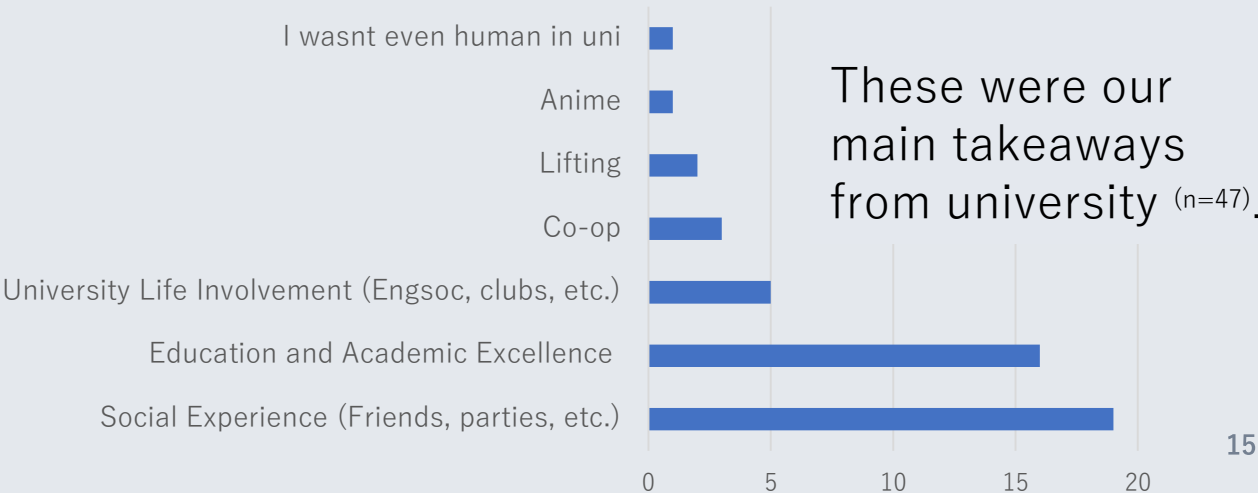
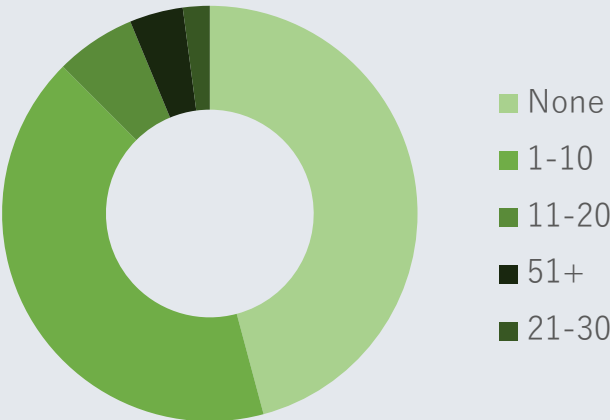
Attendance: Our class attendance was relatively unchanged throughout the years. Most of us actually went to class.



A majority of the friends ChE students⁽ⁿ⁼⁴⁵⁾ had were also in Engineering.

Aside from that, our friends came from over 18 different programs.

88% of the class pulled less than 10 all-nighters.⁽ⁿ⁼⁴⁸⁾



These were our main takeaways from university ⁽ⁿ⁼⁴⁷⁾.

3.5/5

Average ChE Rating

2.5/5

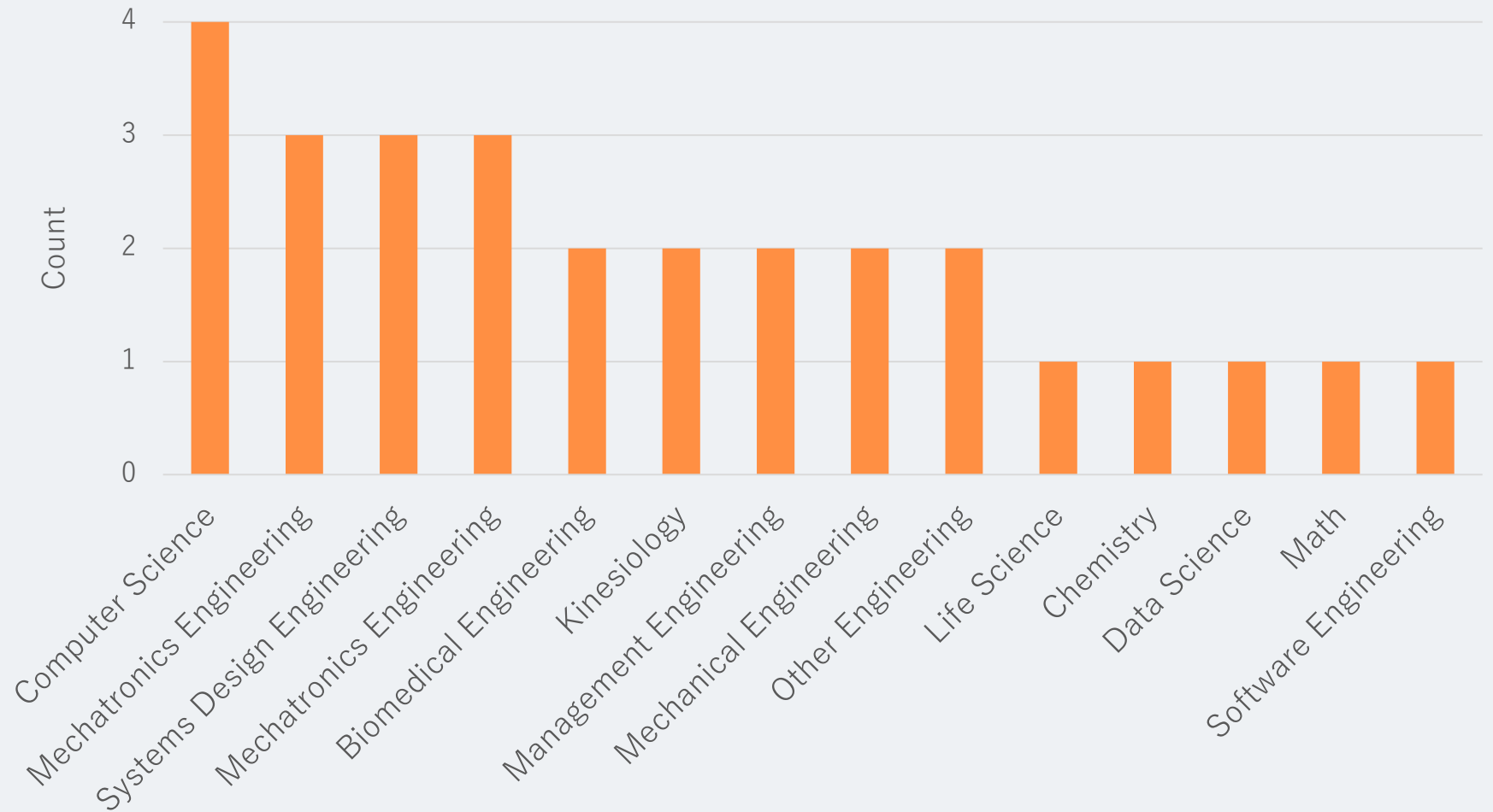
Average ChE Labs Rating
n=46

60% of students said, if they could go back, they would re-enroll in ChE at UWaterloo.

The other **40%** had other ideas.

All in all, students seemed to view their ChE education as above average, since the most common rating was 4 out of 5, given by 25 students.

If they could, students would go back and study...

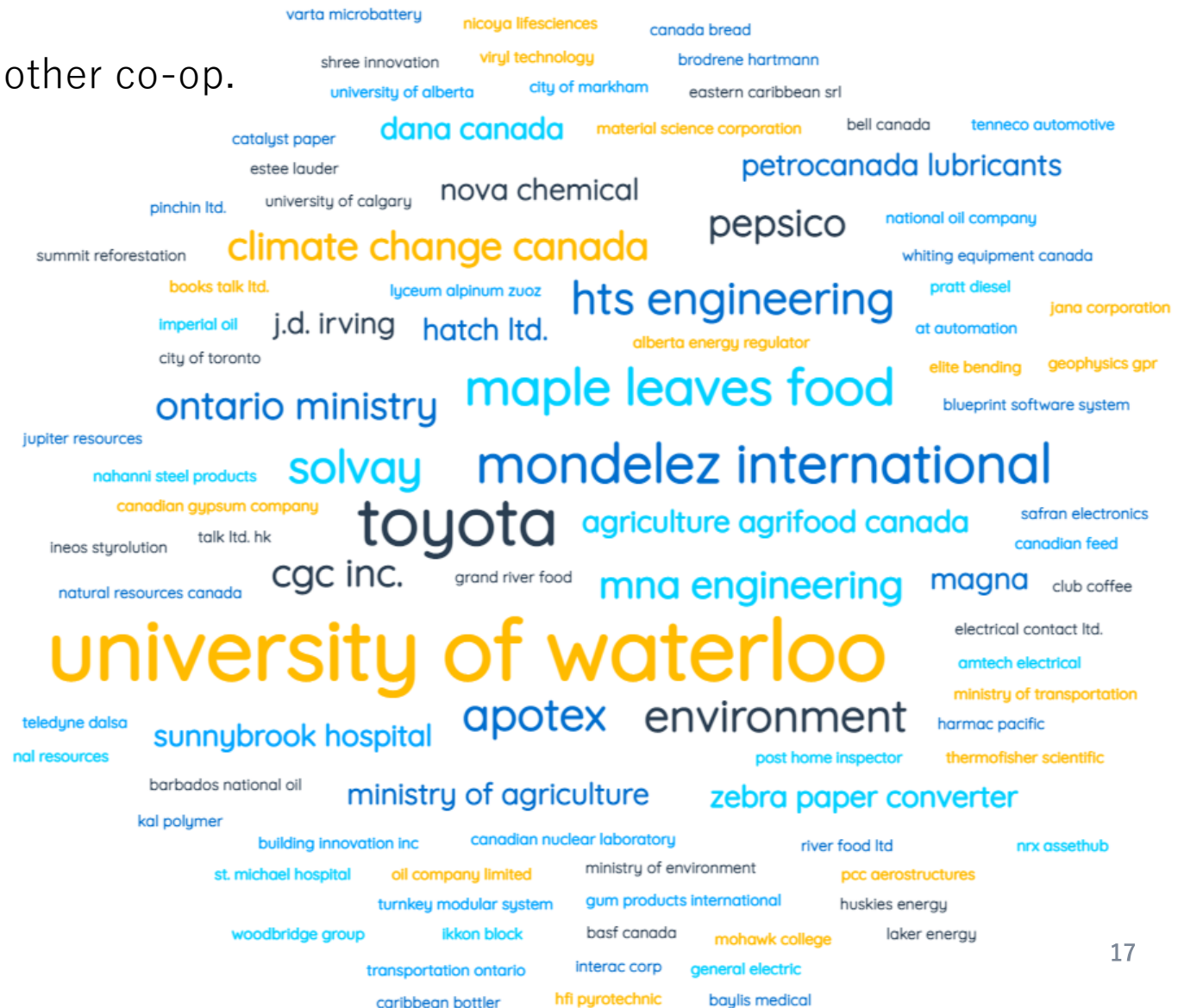


Employers: 46 ChE students have worked at over 129 different companies, shown in the word map.

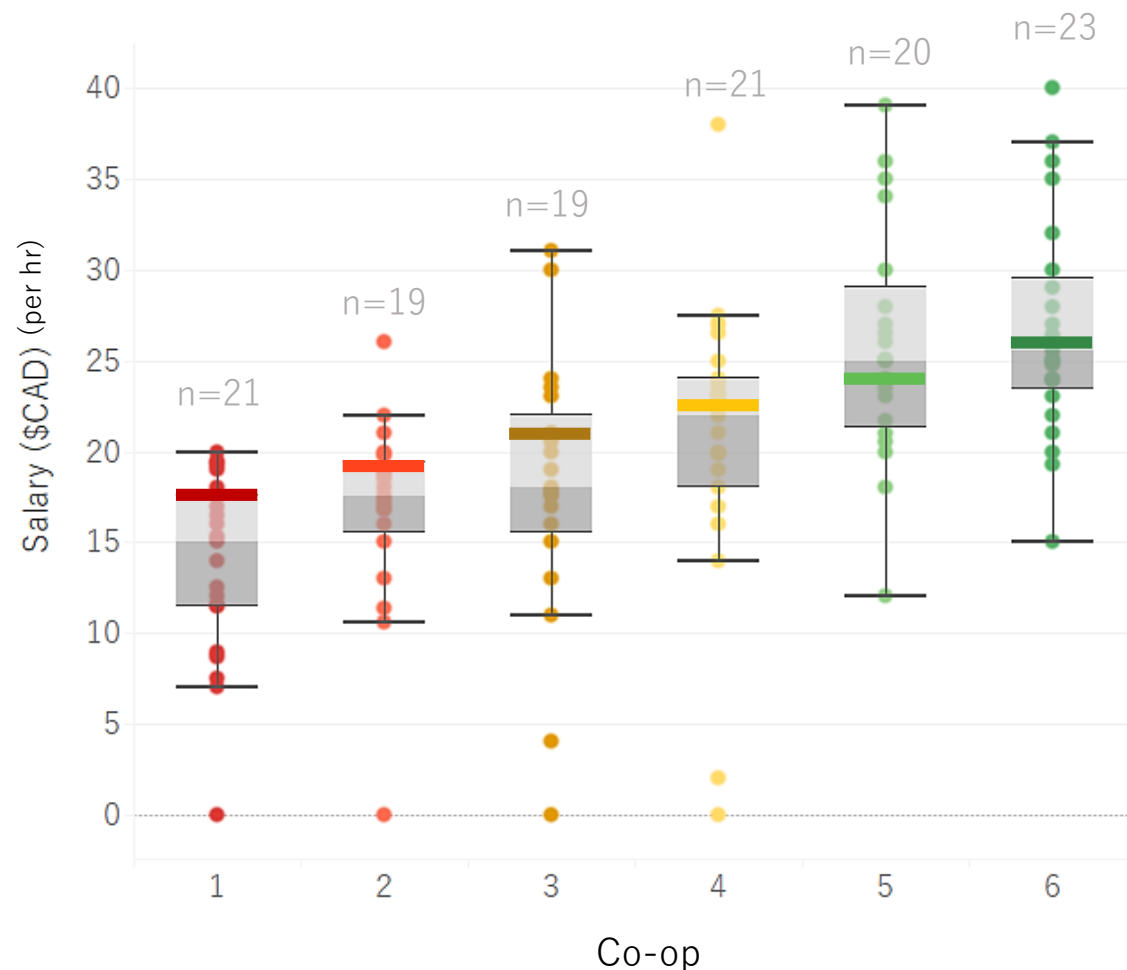
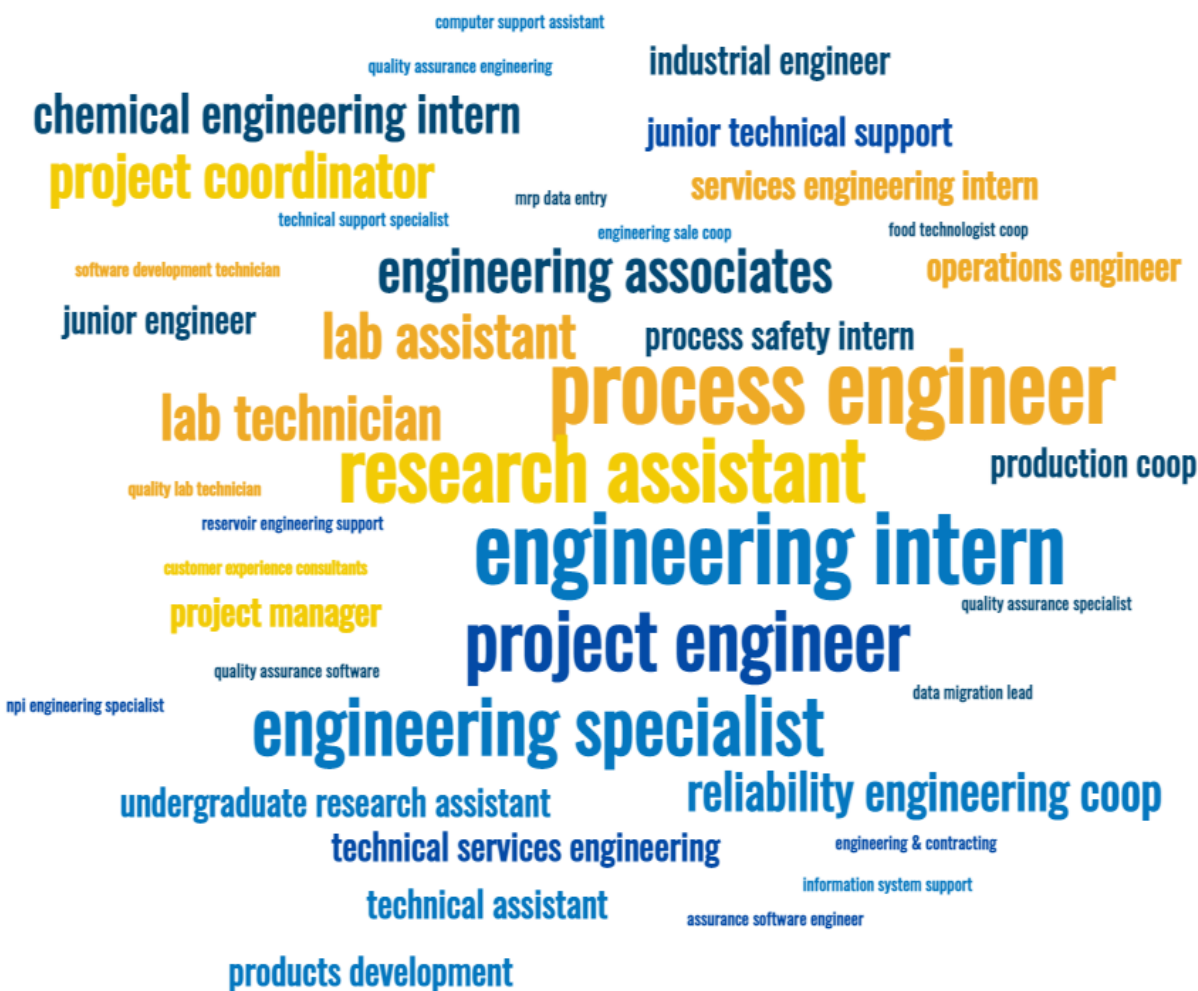
60% of students returned to an employer for another co-op.

Top employers were:

1. University of Waterloo, **22**
2. Toyota Motor Manufacturing Canada, **10**
3. Mondelez International, **6**
4. Maple Leaf Foods, **5**
5. Apotex, **4**
6. HTS Engineering, **4**
7. Solvay, **4**
8. CGC, **3**
9. Environment & Climate Change Canada, **3**
10. MNA Engineering, **3**
11. Patheon, **3**
12. PepsiCo, **3**
13. Suncor Energy, **3**
14. Agriculture and Agri-food Canada, **2**
15. Hatch, **2**



Positions: most popular co-op titles were Process/Project Engineer, Engineering Intern/ Specialist, and Research Assistant. (n=42)

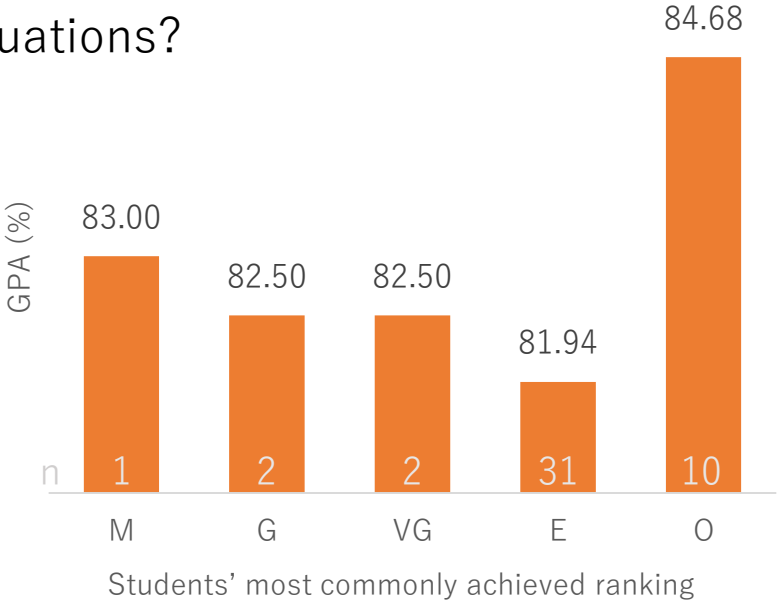
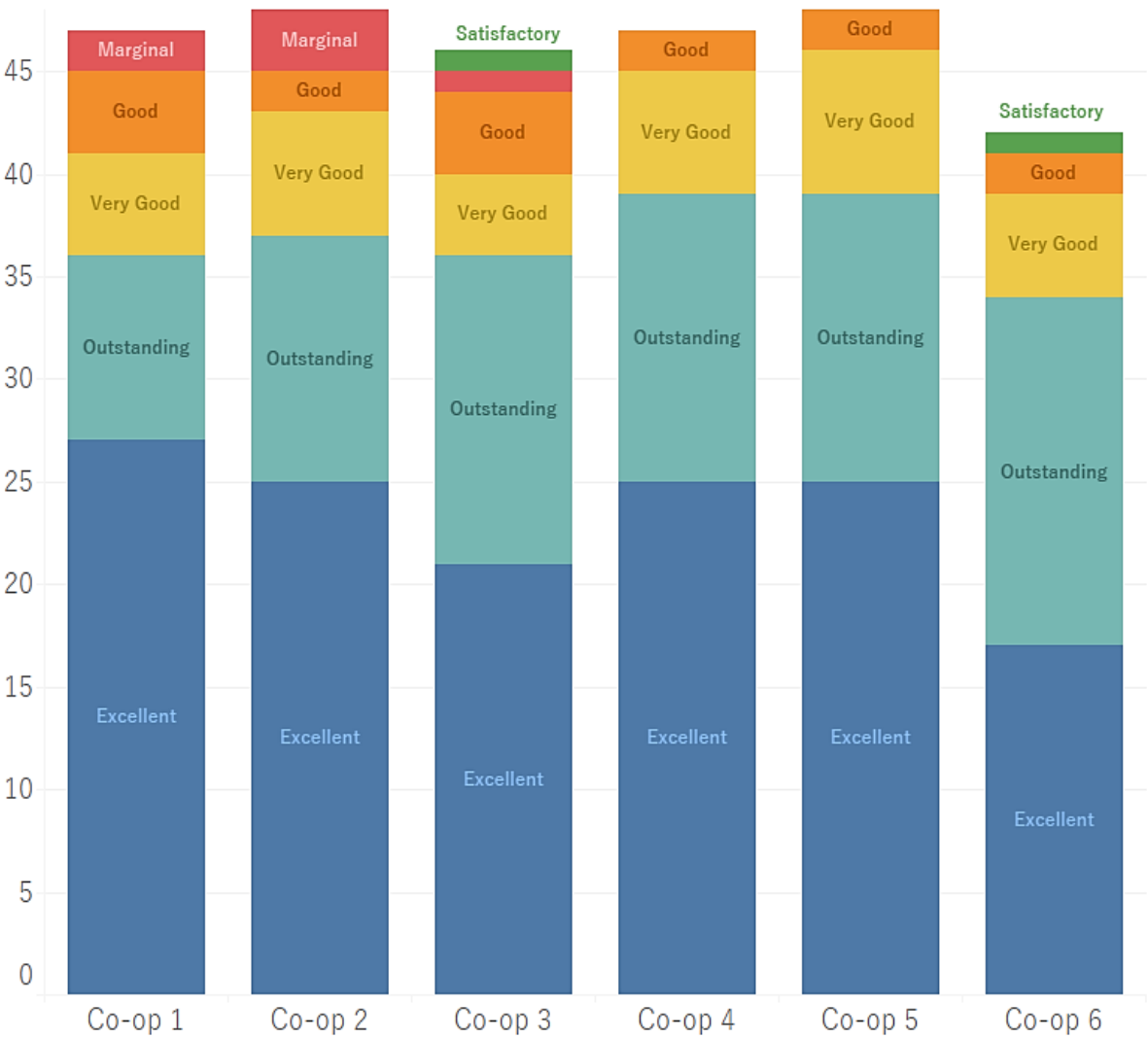


The colored lines represent the CECA Average Salary*. Some students reported no income. (research-based position at a University?)

*Using data from 2019, 2018, and 2017 where applicable. For 2016, 2017 data was also used.

Most students had Outstanding or Excellent as their co-op rankings.

Were there any other factors that affected our evaluations?

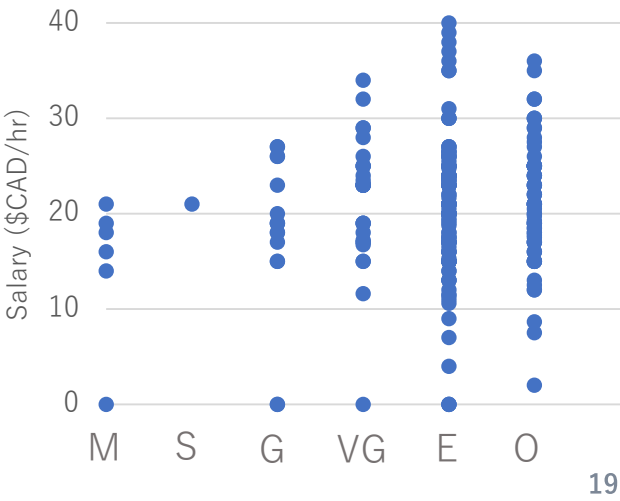


Students who most often got an outstanding had higher university grades overall. Other than this, somehow, the data shows grades getting worse as co-op rankings got better??

Considering sample size, though, it makes sense: Excellent was the most common ranking, leaving more room for variance.

With higher rankings, higher salaries were noticed.

Ranking	Count	Avg \$/hr
Marginal	6	\$ 14.67
Satisfactory	1	\$ 15.00
Good	16	\$ 18.06
Very Good	30	\$ 20.03
Excellent	118	\$ 20.81
Outstanding	73	\$ 22.12

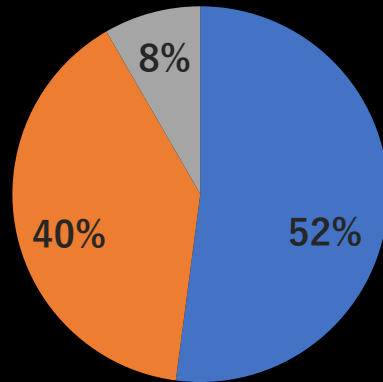


*In ascending order of grade on transcript. M: Marginal, S: Satisfactory, G: Good, VG: Very Good, E: Excellent, O: Outstanding.



WaterlooWorks, Works?

Most students had their co-ops secured in the 1st and 2nd round on WaterlooWorks.



■ 1st/2nd round ■ Continuous ■ Never used WaterlooWorks

12% of students said they have been late to an interview before.

17% of students had an issue with CECA. When they were asked to elaborate, this is what some had to say:

"Wasn't notified of an interview after checking @ 9pm the evening before. CECA said it was my fault I didn't check later that night!"

"Poor communication on offer details"

"Wouldn't validate my arranged co-op"

"Denied a self found job in 1a."

21% of students took a co-op term off, since the degree requires only 5 co-op placements. These were their reasons:

Couldn't find a job (2)

Wanted a break (4)

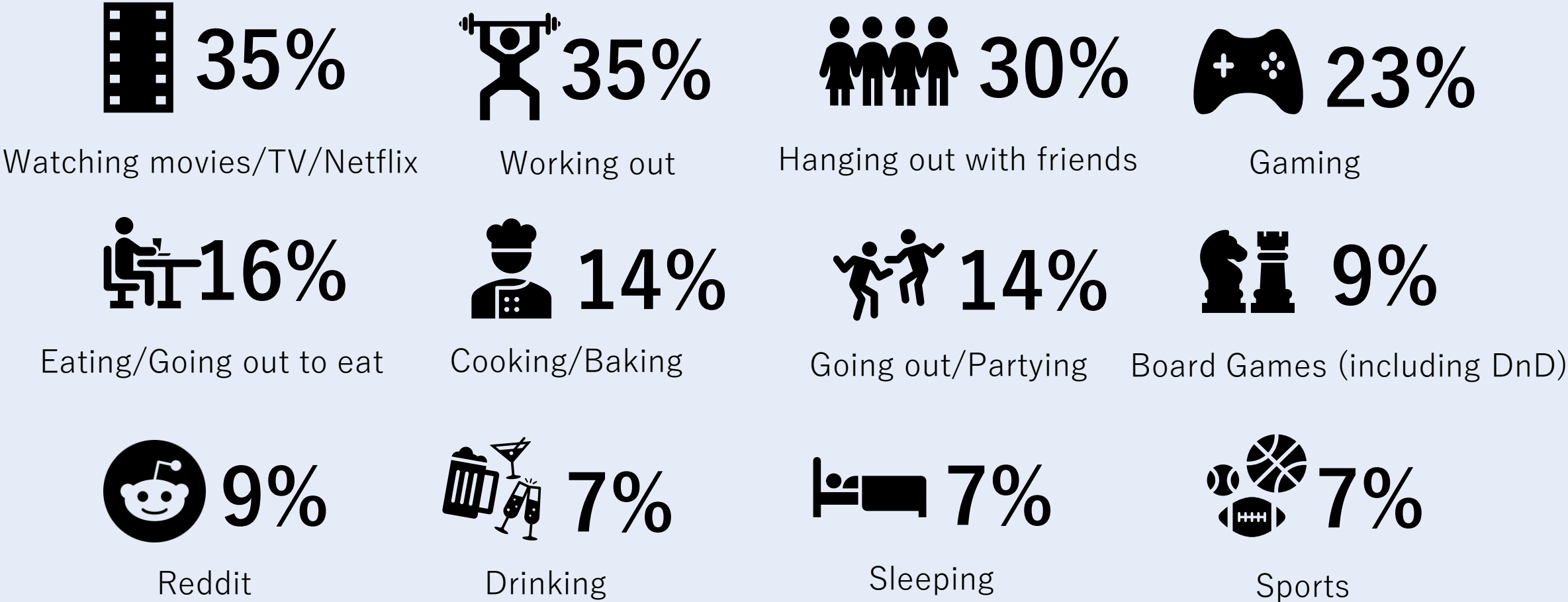
Got a job late/Job didn't fit CECA standards (2)

Went on exchange (1)

38 students were involved in over 60 different extracurricular activities, shown in this word map. Lots of intramurals!

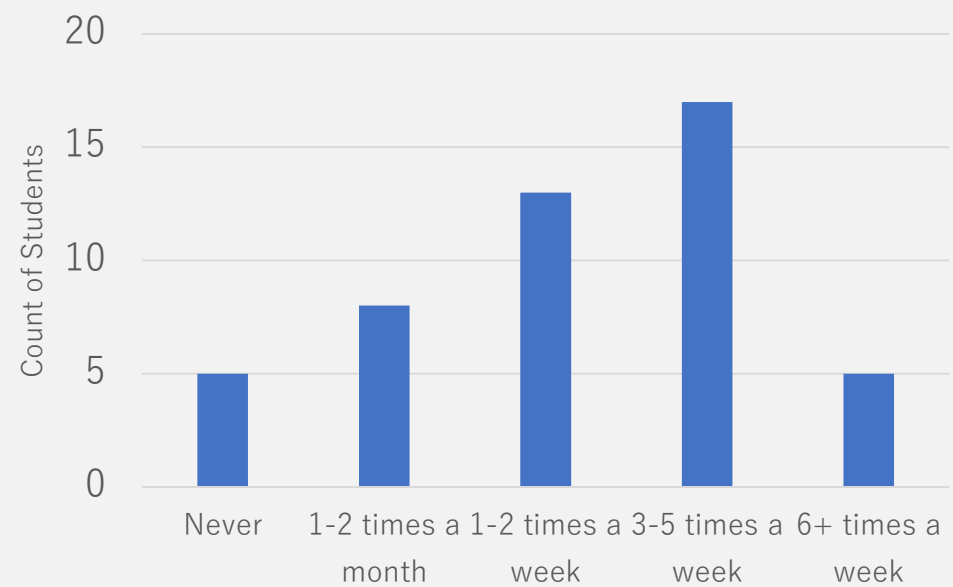


This is how 43 students spent their leisure time:

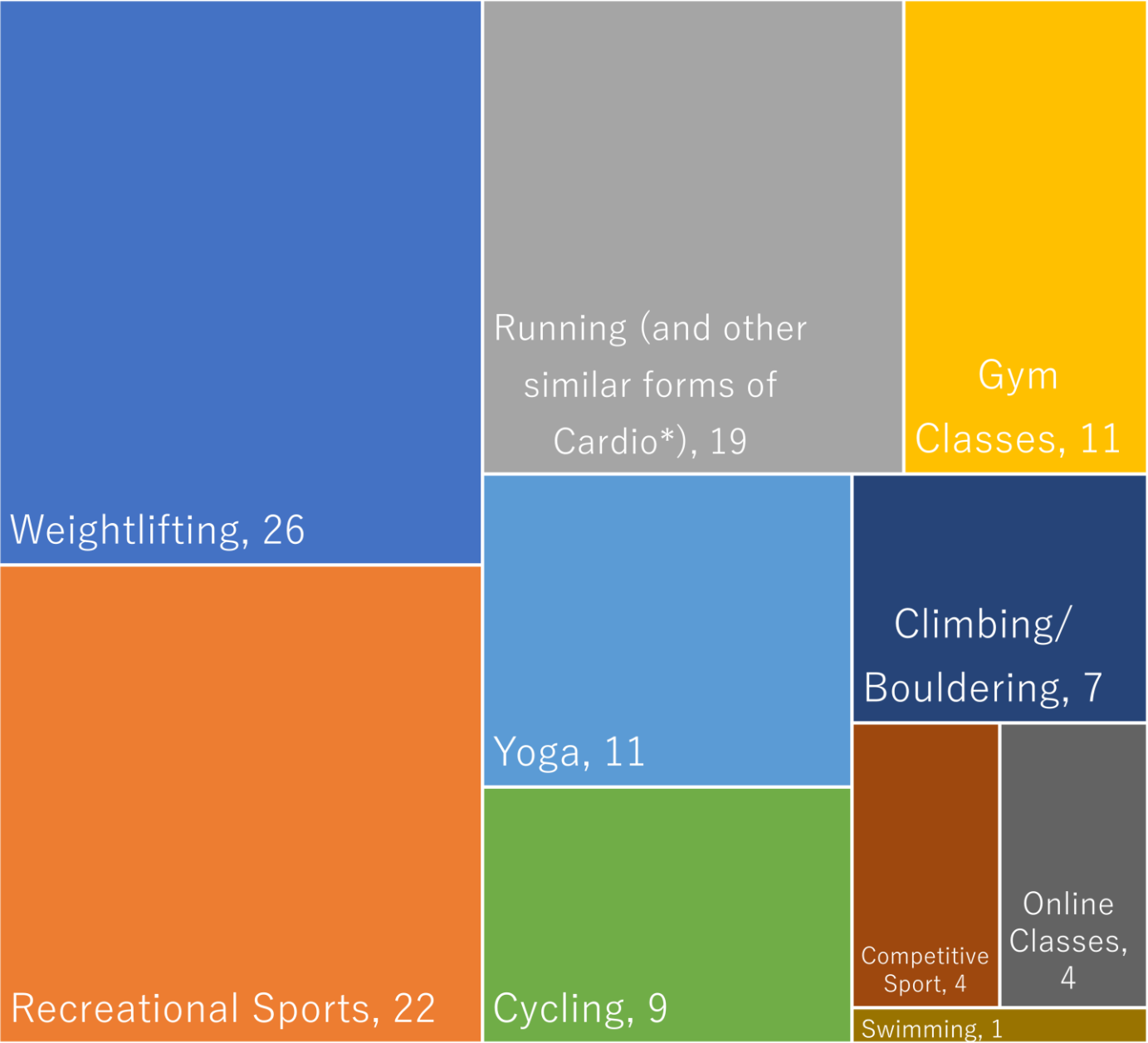


Other notable activities include: Bible Study, Boulderling, Playing an instrument, Drinking bbt, Reading, Gardening, Listening to music, TikTok, Photography, Hot Yoga, and Self-care.

So, how often did ChE 2020 actually exercise, and how?

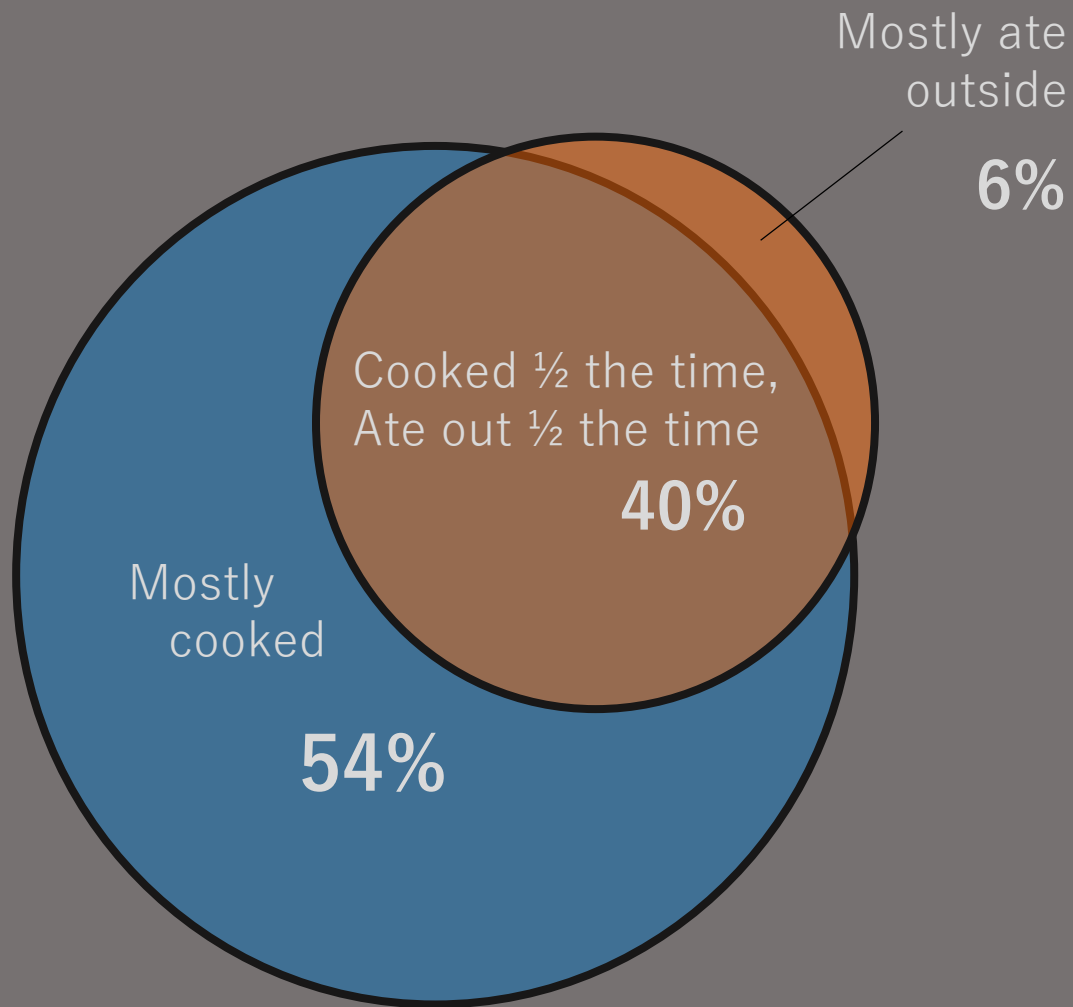


Most of us worked out 3-5 times a week, staying fit with a wide array of activities. The most common way we worked out was with weightlifting, which 59% of students did.



*Other forms of Cardio include cycling, completing a burpees challenge

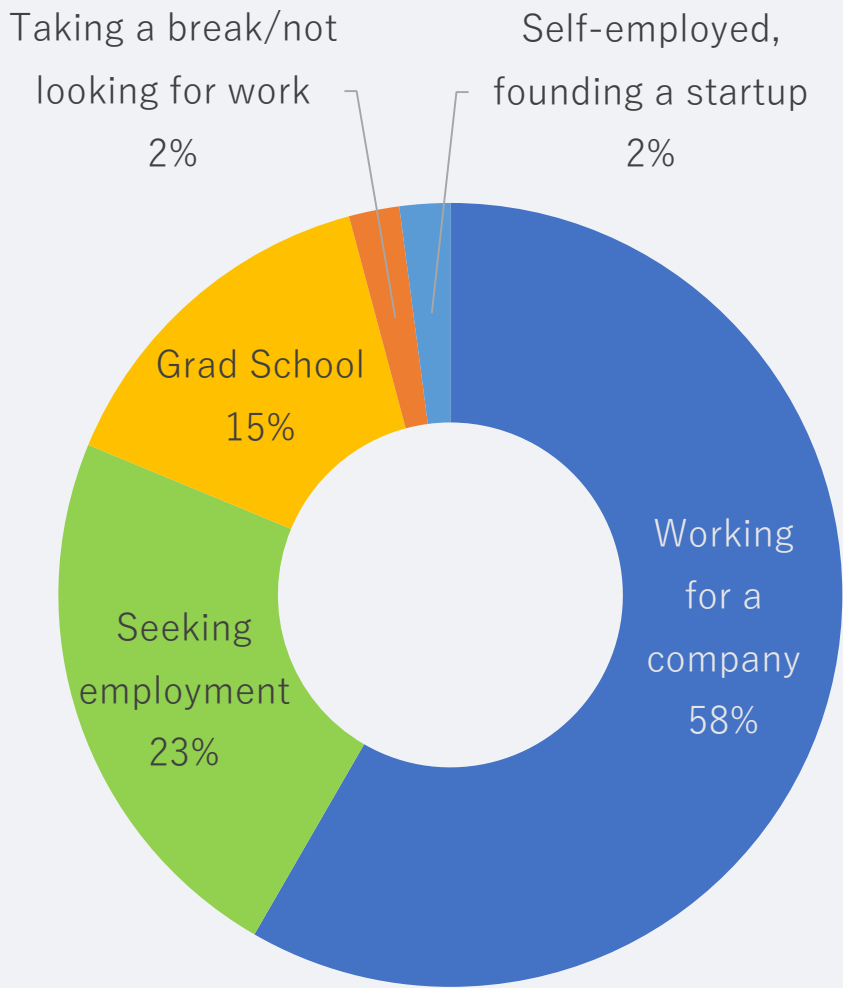
Food: Out of the 48 students, 54% cooked most of their meals and 40% cooked half of their meals. Which places were the most popular to eat at?



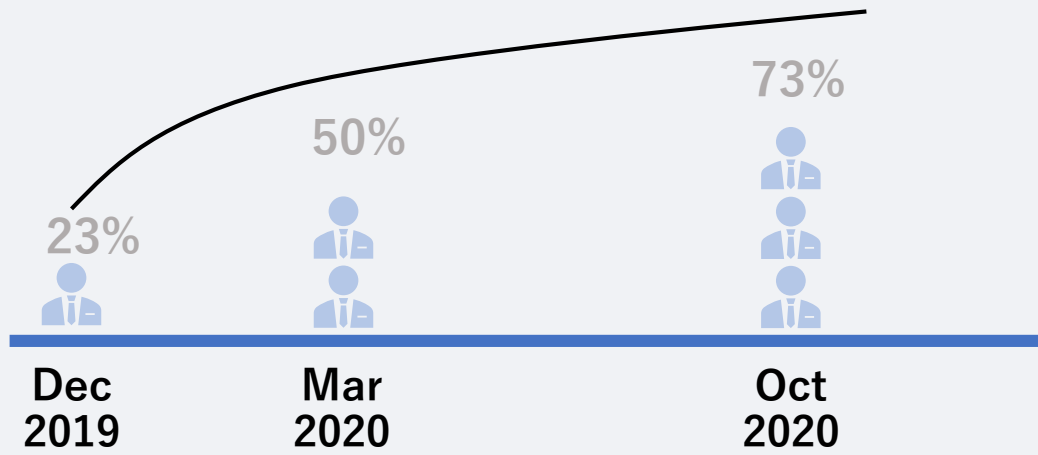
3	Baba Grill	2	Shawarma Plus
2	Bao Sandwich Bar	2	William's Cafe
2	Chen's	2	Kabob Hut
2	Harvey's	1	The Bombshelter Pub
2	Kenzo Ramen	1	Busan BBQ
2	Mikey's	1	Copper Branch
2	Nuri Village	1	Foodie Fruitie
2	Panino's	1	Fresh Burrito
2	Poke Box	1	Gol's Lanzhou Noodle

There were so many selected favorites that this list* only makes up 56% of them.

As of October 2020, this was what ChE students were doing.



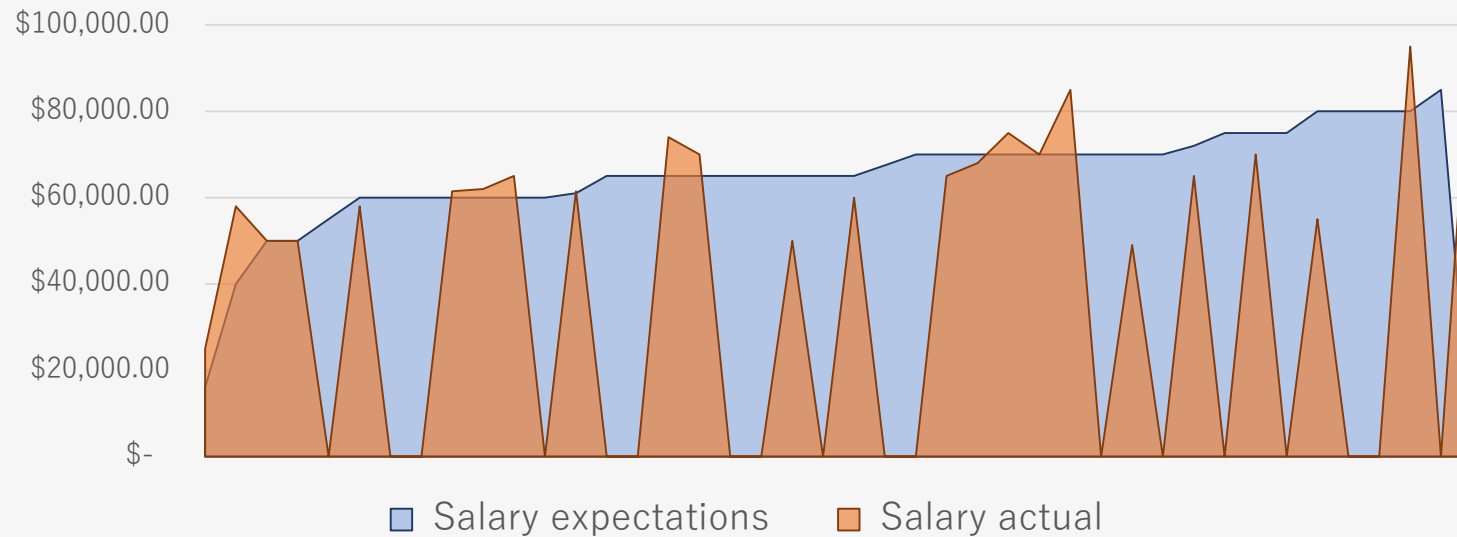
There were 40 students seeking employment post graduation.



By October 2020, 73% of these students were hired. COVID-19 definitely impacted the process.

As for the 7 students venturing into postgraduate studies, this is what they chose to study:

- | | |
|---|-------------------------------|
| Biomedical Engineering | International Business |
| Chemical Engineering (2) | Material Science |
| Chemical Engineering & Applied Chemistry | Process Engineering |



\$65,280.49

Average Expected Salary, Annual, CAD

Median: \$65,000

Min: \$16,000

Max: \$85,000

n = 41

\$64,333.33

Average Actual Salary, Annual, CAD

Median: \$63,500

Min: \$25,000

Max: \$102,000

n = 24

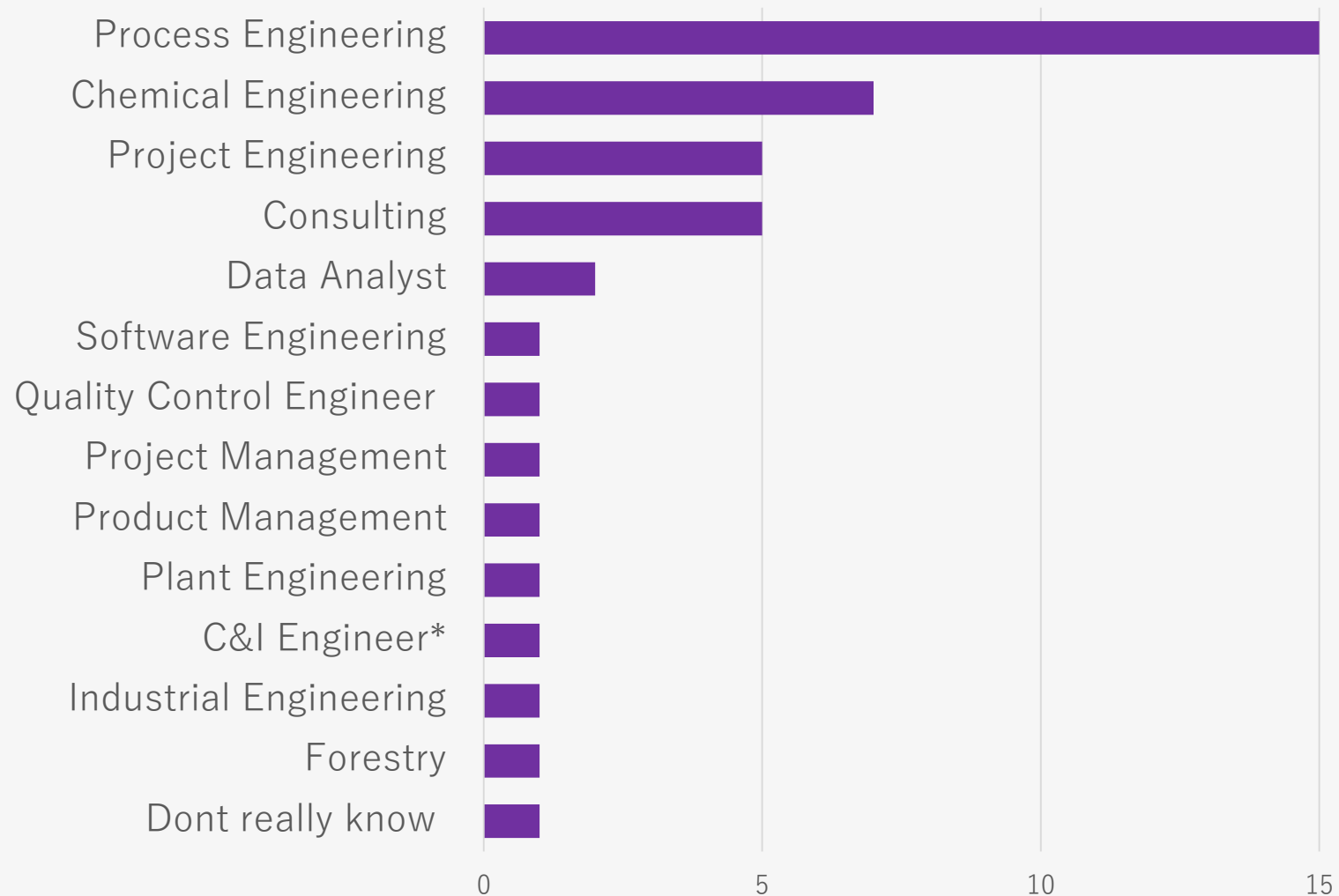
The ChE students had reasonable expectations when it came to the salary they expected straight out of university. And for those who were employed, the average was in very close proximity to most students' expectations.

Did the job location impact the salary employed students are receiving?

Alberta and Sarnia came out as the highest paying locations.

Job Location	Count	Avg. Annual Salary, CAD
Alberta	3	\$ 98,500.00
Sarnia	1	\$ 85,000.00
Toronto/GTA	16	\$ 65,090.91
Ottawa/Montreal	1	\$ 58,000.00
Kitchener/Waterloo	9	\$ 56,333.33
Nova Scotia	1	\$ 55,000.00
BC	2	\$ 47,500.00

What job titles or roles were students seeking in the workplace?⁽ⁿ⁼⁴⁴⁾



The most common roles students looked for were process engineering, chemical engineering, and project engineering; showing that most students stuck with their field of study.

Some students were looking to venture into tech, looking for product management, data analysis, and software engineering roles.

Student Loans?

(n=42)

\$22,252.38

Average loans
owed

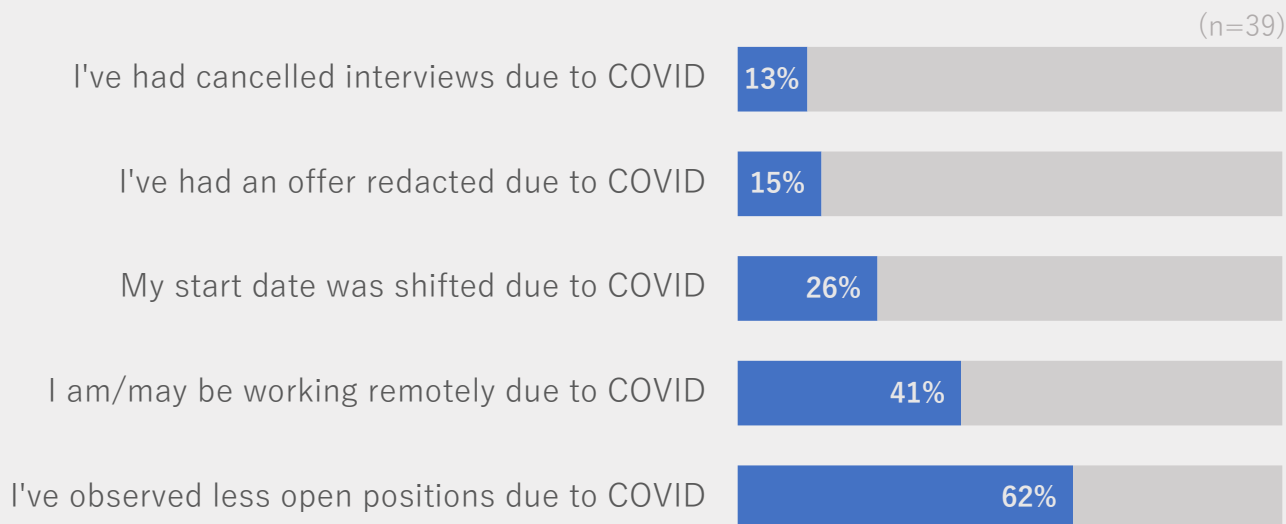
\$467K

ChE 2020's total
owing in student
loans

21 students

Graduating with
no loans

How did COVID Impact us?

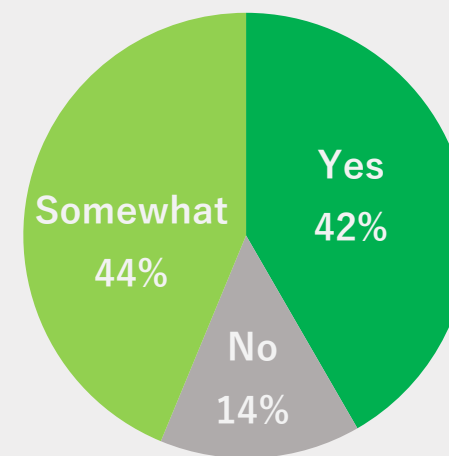


83% of students⁽ⁿ⁼⁴⁶⁾ had their travel plans impacted by COVID.

Further down the line...

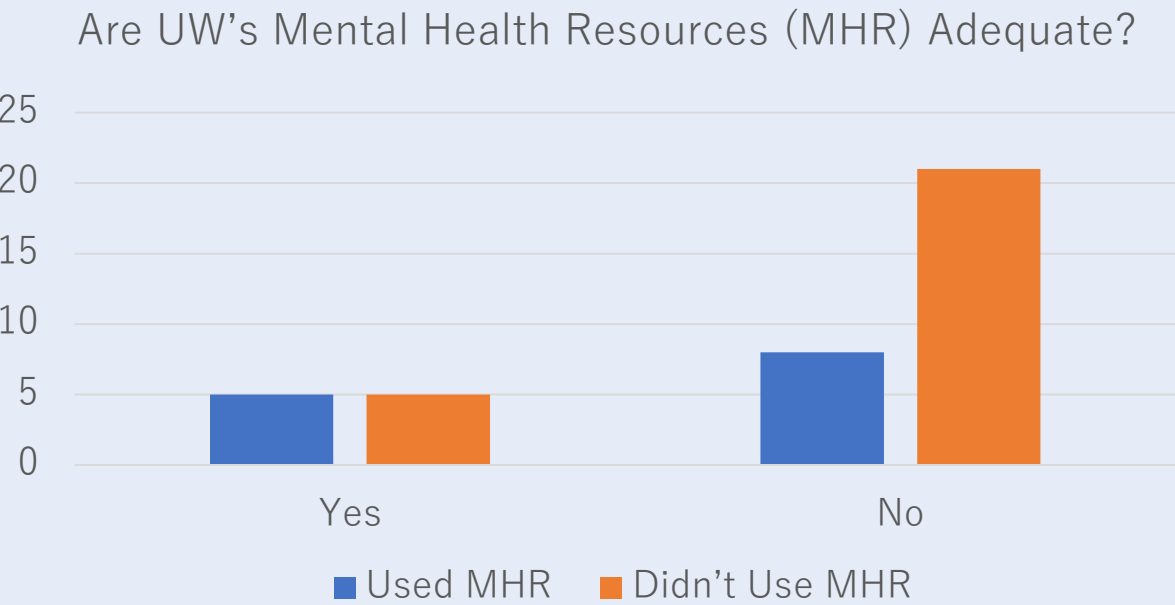
79% of students are looking to get their P.Eng. ⁽ⁿ⁼⁴³⁾

How did the students feel about the future of chemical engineering as a field? Were they optimistic?



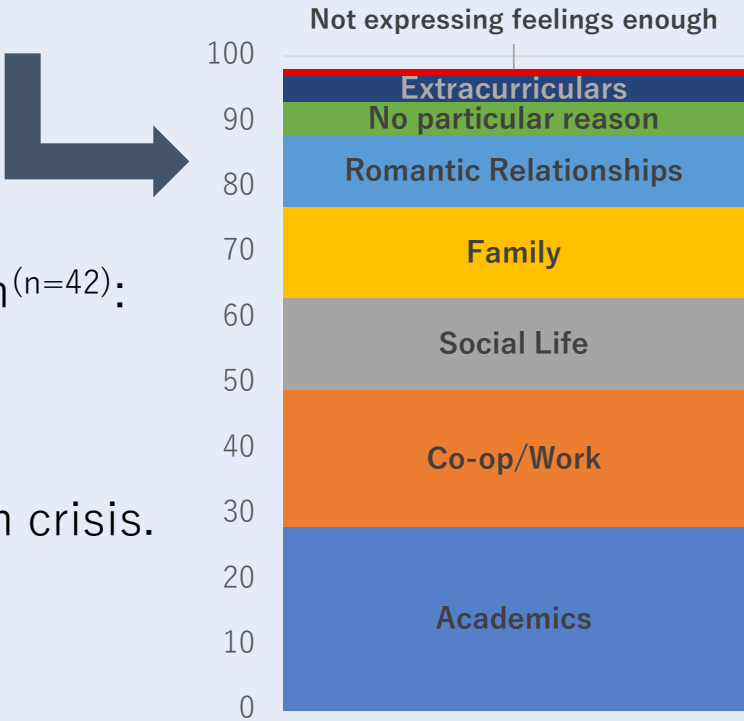
Most students were at least somewhat optimistic about the future of chemical engineering. As a broad field, it certainly plays a role in many industries.

28% of students ⁽ⁿ⁼⁴⁶⁾ used the University of Waterloo's Mental Health Resources.



26% of students ⁽ⁿ⁼⁴⁶⁾ said that UW's Mental Health Resources were adequate. Of the students who used the resources, 39% said it was adequate.

There were several factors that influenced the students' mental health:



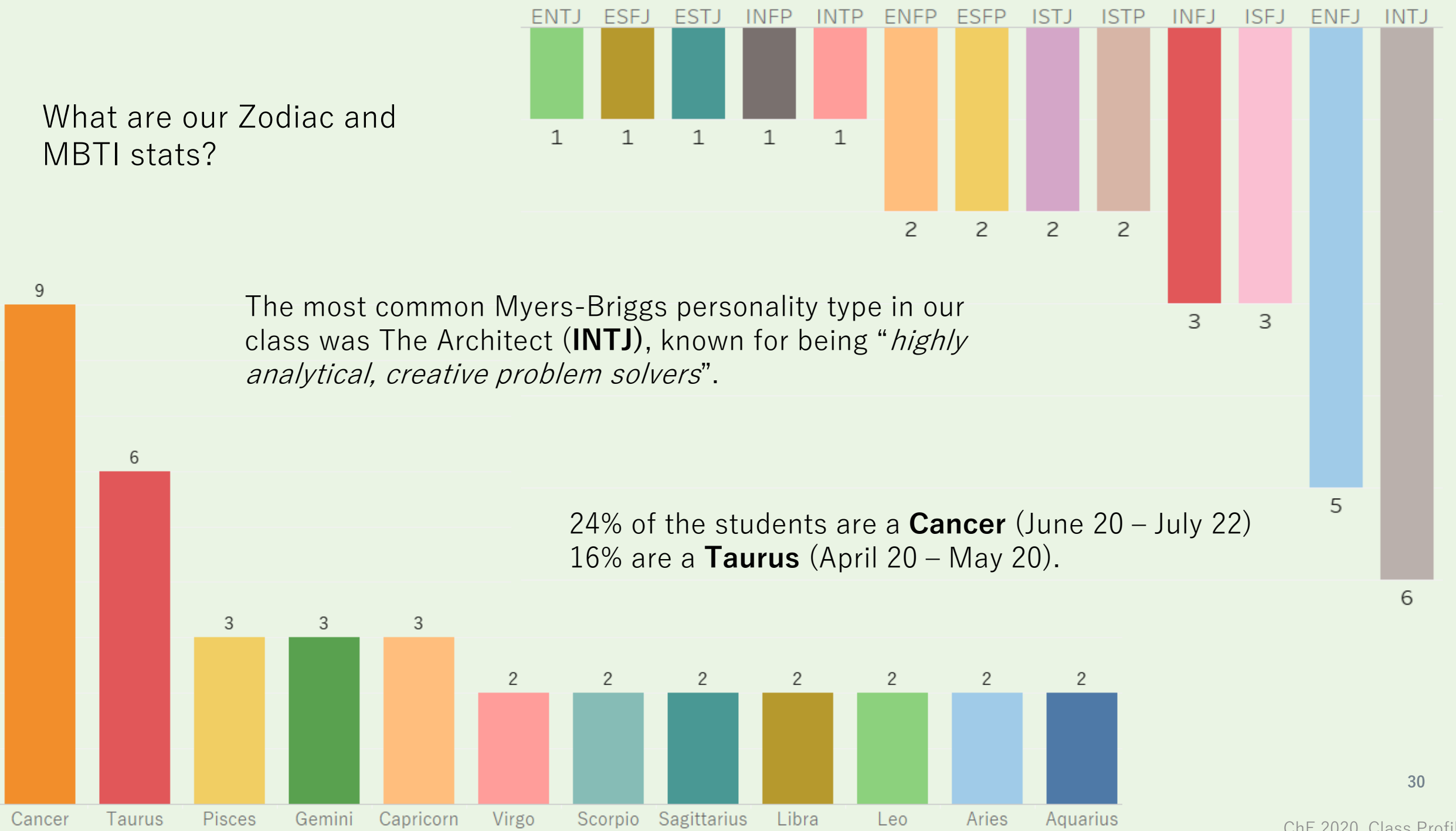
Other statistics about the ChE students' experience with mental health⁽ⁿ⁼⁴²⁾:

- 64% have struggled with mental health.
- 60% have helped a friend through a mental health issue or short term crisis.
- 55% have sought professional help for their mental health.

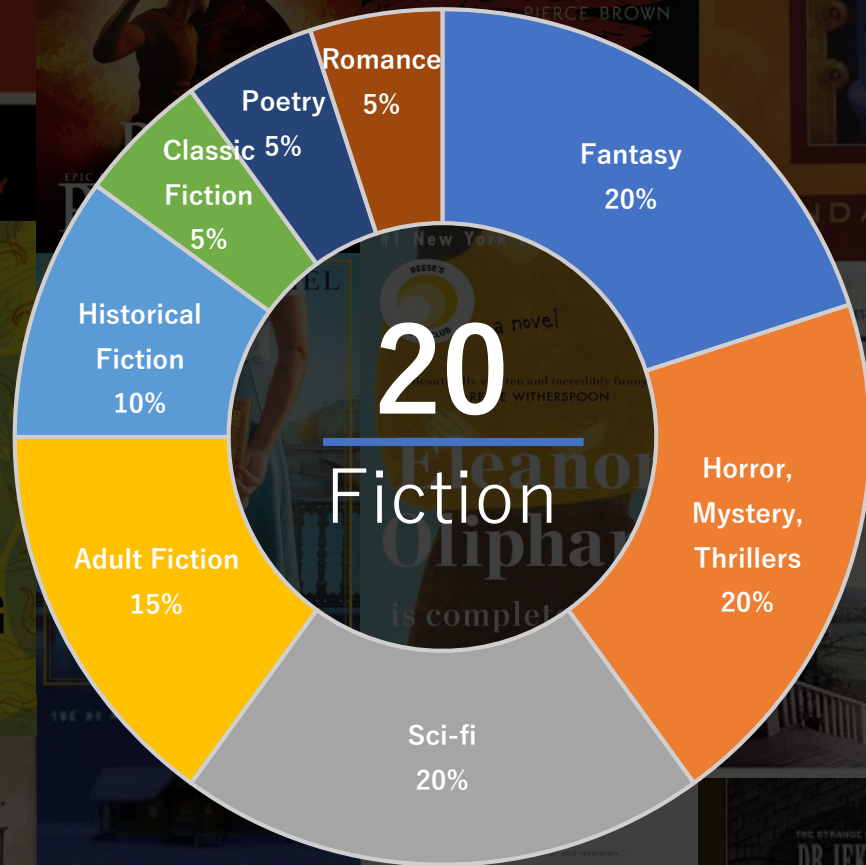
What are our Zodiac and MBTI stats?

The most common Myers-Briggs personality type in our class was The Architect (**INTJ**), known for being “*highly analytical, creative problem solvers*”.

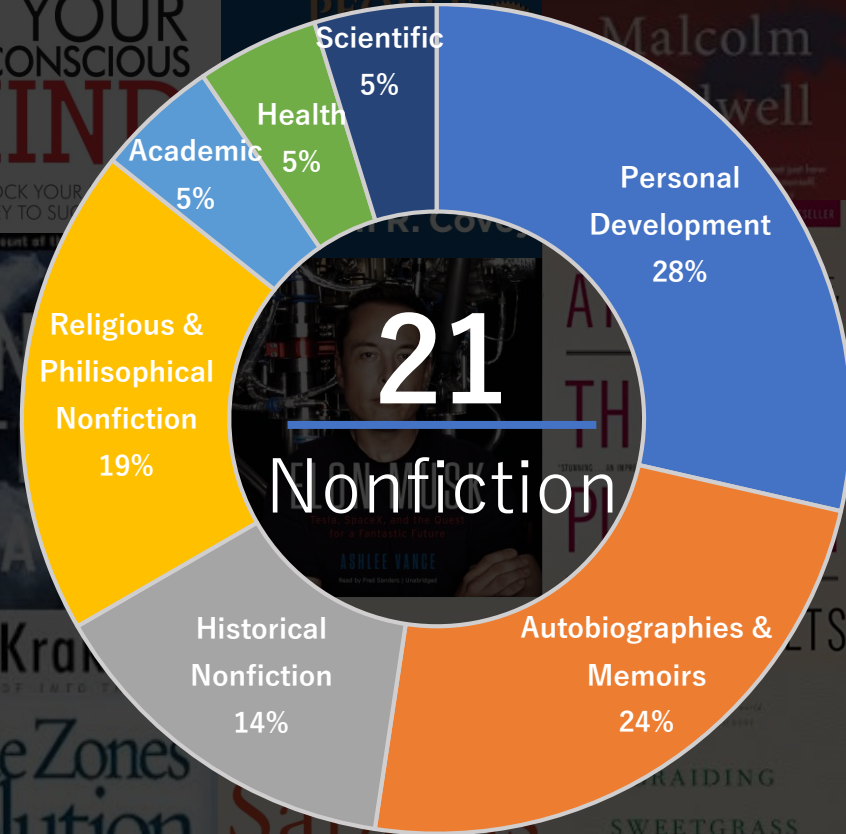
24% of the students are a **Cancer** (June 20 – July 22)
16% are a **Taurus** (April 20 – May 20).



What were the last books we read?



vs.



There was a pretty even split between fiction and nonfiction readers (although we have to consider that this doesn't factor in other books the students have read, just the most recent one). Most popular genres in each category were (respectively): fantasy, sci-fi, horror/mystery/thriller; and autobiographies/memoirs, personal development, and religious/philosophical/historical nonfiction.

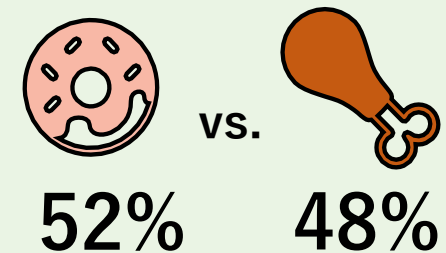
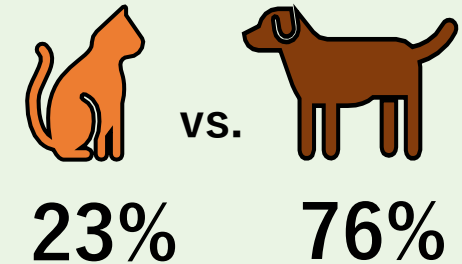
What were our favorite fruits?⁽ⁿ⁼⁴⁴⁾



79% of students like pineapples on their pizza.

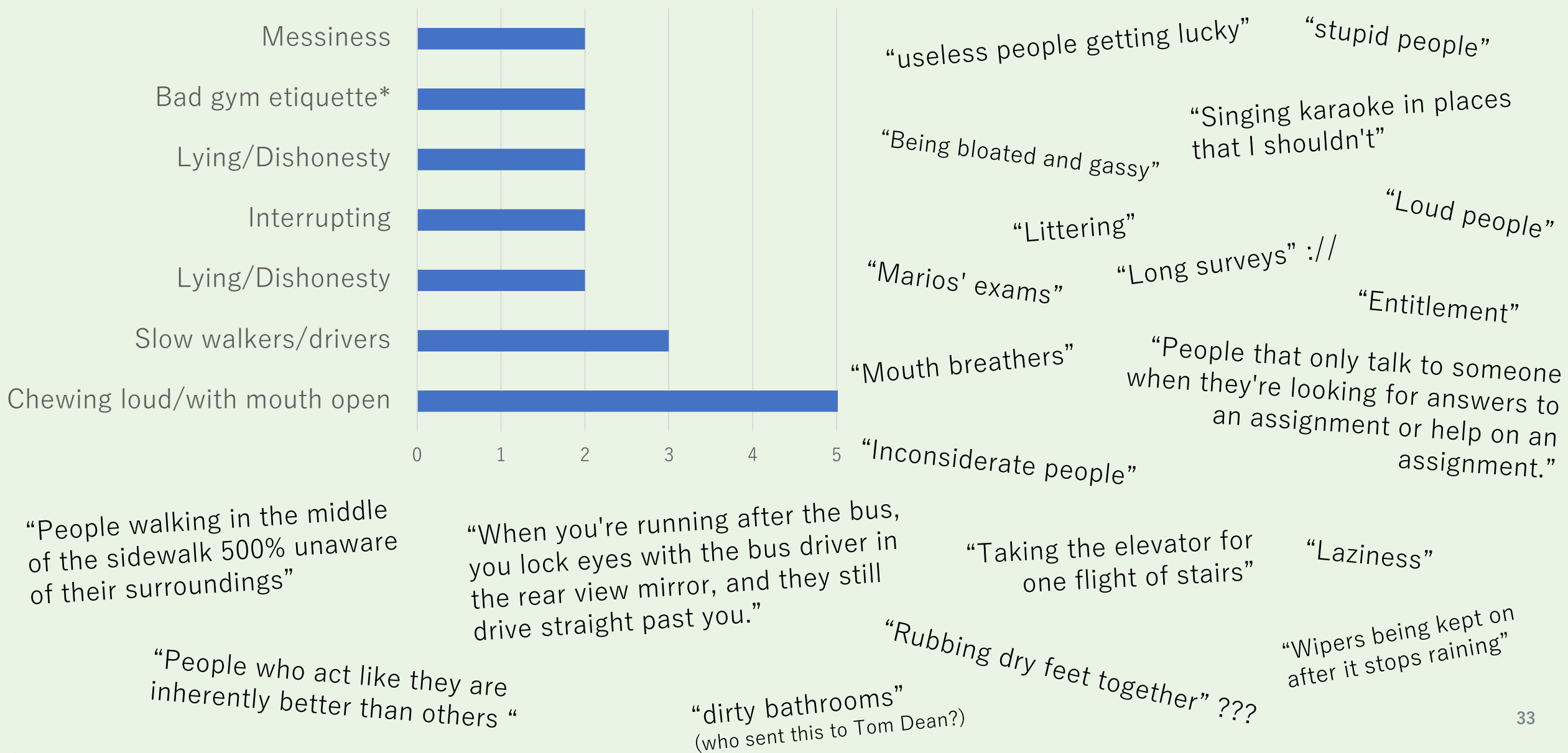
Don't be a hater.

If you like dogs more than cats, you're definitely with the majority of ChE.

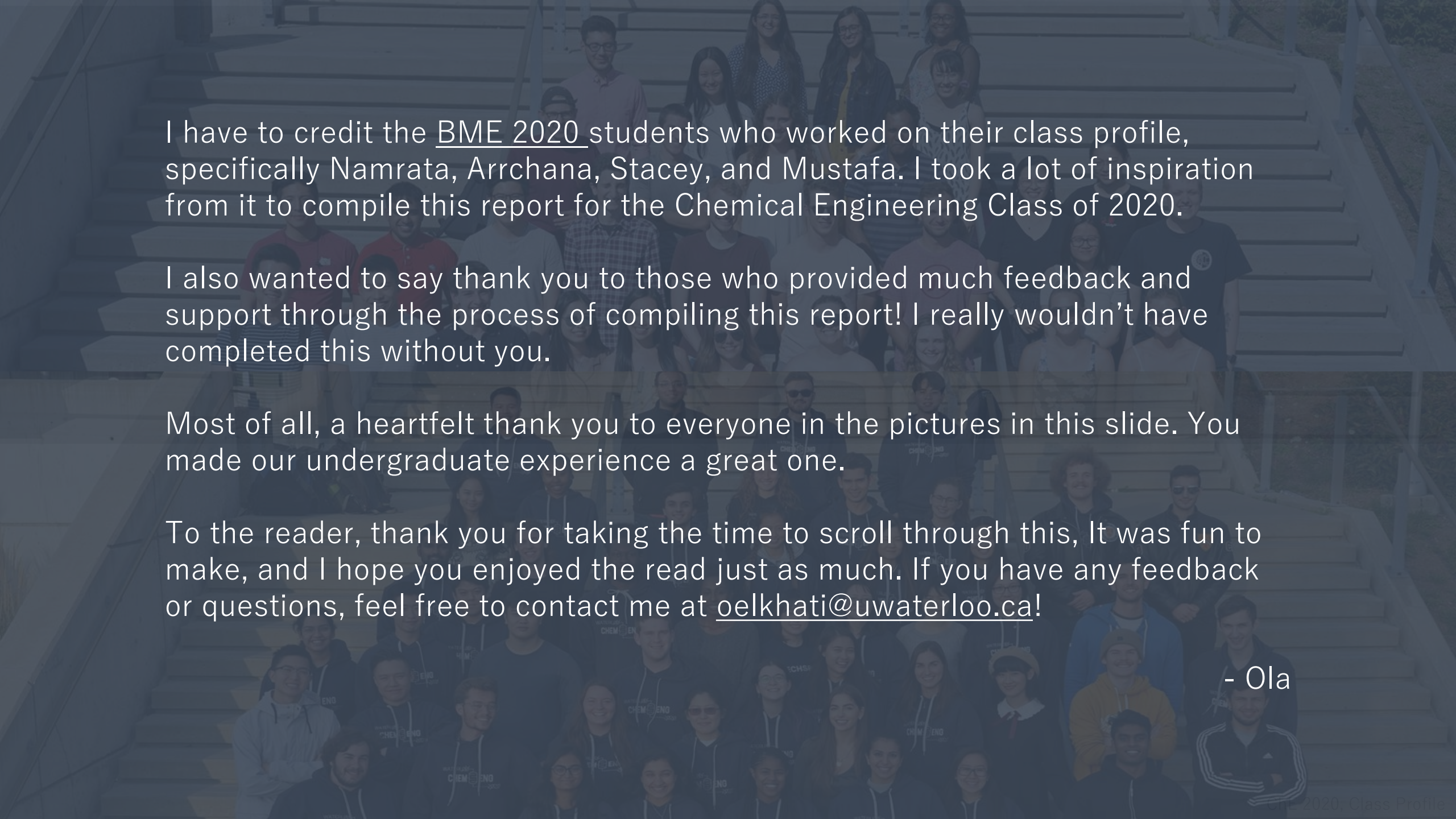


When it came to sweet and savoury, we basically met halfway.

And finally, our biggest pet peeves?⁽ⁿ⁼⁴⁰⁾ Some students were really particular.



*Specifically, bench pressing with feet on bench and half-reppers.



I have to credit the BME 2020 students who worked on their class profile, specifically Namrata, Arrchana, Stacey, and Mustafa. I took a lot of inspiration from it to compile this report for the Chemical Engineering Class of 2020.

I also wanted to say thank you to those who provided much feedback and support through the process of compiling this report! I really wouldn't have completed this without you.

Most of all, a heartfelt thank you to everyone in the pictures in this slide. You made our undergraduate experience a great one.

To the reader, thank you for taking the time to scroll through this, It was fun to make, and I hope you enjoyed the read just as much. If you have any feedback or questions, feel free to contact me at oelkhati@uwaterloo.ca!

- Ola